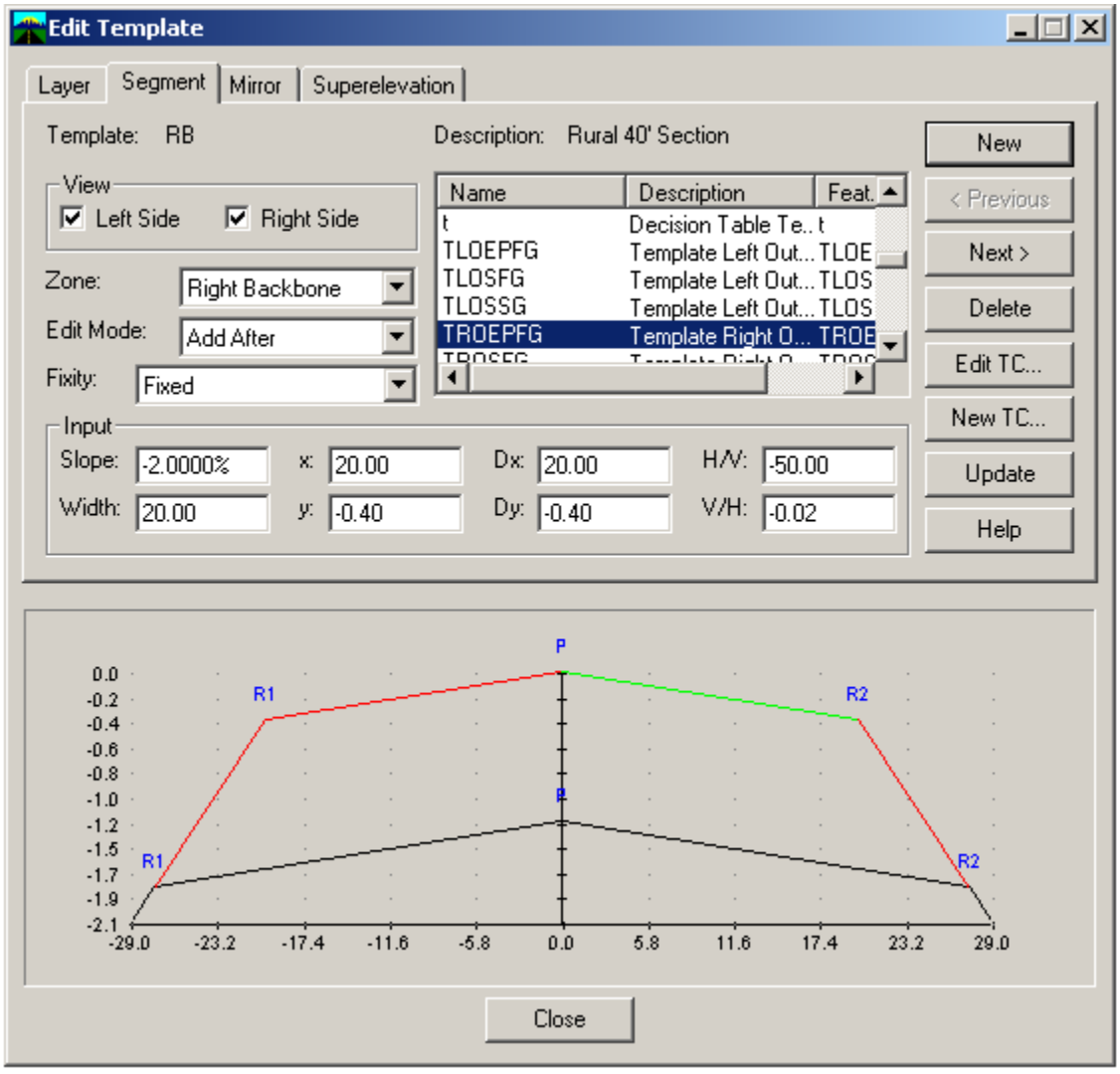
ADOT
STANDARD
ENGLISH
TYPICAL SECTION LIBRARY
TEMPLATES, DECISION TABLES
AND
EXAMPLE CUT AND FILL TABLES



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Roadway Technical Support Section
Updated 09-12-02

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ADOT STANDARD TEMPLATE LIBRARY

The former manager of the Computer Aided Engineering Section, Cliff Thomas, developed a standard set of template libraries for use in InRoads. The Roadway Technical Support Section has maintained and enhanced this file since it's inception. These libraries contain three decision tables, C-02.10, C-02.20 and C-02.30 that are used to define the slopes that agree with the slope standards of the same names. There are eighteen templates matching the standard roadway sections. These templates can be used as a starting point in developing the necessary template for each specific project or specific section of a project. In addition there are three example cut and fill tables.

The template library to be used is dependent upon the version of InRoads being used for the project. Their names are english_V71.tml, english_V81.tml and english_V82.tml. The files are located in the Roadway Support Development directory structure and are available on the ADOT Roadway Design Section menu. Consultants can download these files from the Roadway Engineering Group's web site. ***This example is in english units***.

At the beginning of a project, the appropriate template library should be copied into your project directory and modified as necessary to meet the requirements of your specific project. It is suggested that the templates or decision tables that will not be used be deleted from your copy of the template library to reduce the size of the file and make it easier to navigate.

GENERAL NOTES

1. All of the templates were developed using an assumed structural Section thickness of 15". Adjustments will have to be made to the appropriate variables within the template to account for the correct structural section thickness of the project you are working on.

2. The cut ditch widths for the C-02.10, C-02.20 and C-02.30 decision tables were assumed to be 20', 15' and 8' respectively. If your project requires different cut ditch widths, modifications will have to be made to the appropriate decision table.

3. While trying to simplify this document, we have made some changes since it's first publication. The transition control point (T.C.) names have not changed (i.e. Hinge, Ditch Bottom, t, etc.) but we have added a reference point that corresponds to each point in the decision table, such as Hinge=(H) where Hinge is the T.C. name, and the (H) is the reference point. These reference points were then combined to make Segments [i.e. Segment (HA), refer to the attached Figures 6A-8B.

4. The transition control point named "Hinge" must be defined on the template backbone as the last point on the left and right, as shown on the typical sections for the decision tables.

   The following **DECISION TABLE NOTES** are a Segment by Segment explanation of the logic used in the decision tables. The values shown in the following notes represent the values in decision table C-02.10. Refer to the other two tables in the attached documentation for the appropriate values for them.

DECISION TABLE

C-02.10

Segment (HA)
This is the first line evaluated. It starts at a T.C. point called **Hinge=(H)** that must be defined on the backbone of the template being used. It does not seek an intersection with the target surface, it simply defines the location of the T.C. point called **Ditch Bottom=(A)** on a slope of –16.667% (-6:1) a distance of 11’ from the T.C. point called **Hinge=(H).**

a) The 11.00’ shown for the width assumes a cut ditch width of 20.00’. If this is not the case, this value will have to be changed.

b) This entry defines the location of the T.C. point called **Ditch Bottom=(A)**, and instructs the system to generate a linear feature. The linear feature can be displayed in graphics when the Roadway Modeler is run if the necessary software switch is turned on.

c) The target is defined as a “DTM” and is named ground. You can load your existing surface, go to “Surface>Surface Properties”, and temporarily rename it to “ground”, or simply change the name of the target surface in the decision table to match the surface you are working with.

Segment (AB)
This entry starts at **Ditch Bottom=(A)** seeks to intersect the target DTM with a +16.667% (+6:1) slope extended a maximum horizontal distance of 36.00’ which would define a point called **Cut=(B)**. If an intersection is encountered, the intercept point will be a vertex defining the cut catch point/cut line for the project. If an intersection is not encountered, then the next line is evaluated.

Segment (AC)
This entry again starts at **Ditch Bottom=(A)** and establishes a temporary point **t=(C)**, a horizontal distance of 36.00’ from **Ditch Bottom=(A)**. No attempt is being made to intersect the target. The next line is then evaluated.

Segment(CD)
This entry starts at the previously defined point **t=(C)** and seeks to intersect the target DTM with a +180,000% slope extending a maximum horizontal distance of .01’. A +180,000% slope is equivalent to 1800 ft per foot. If you limit the horizontal distance to .01’, the maximum vertical distance that this slope can extend to 18’. If this segment intersects the target DTM, then a segment is generated from **Ditch Bottom=(A)** to variable **Cut=(D)**. If an intersection is encountered, then the intercept point will be a vertex defining the cut catch point/cut line for the project. If an intersection is not encountered, then the next line is evaluated.

Segment (AE)
This entry starts at the previously defined **Ditch Bottom=(A)** and seeks to intersect the target DTM with a +50% (+2:1) slope extending a maximum distance of 500.00’, which would define **Cut=(E)**. If an intersection is encountered, then the intercept point will be a vertex defining the cut catch point/cut line for the project. If an intersection is not encountered, then the next line is evaluated.

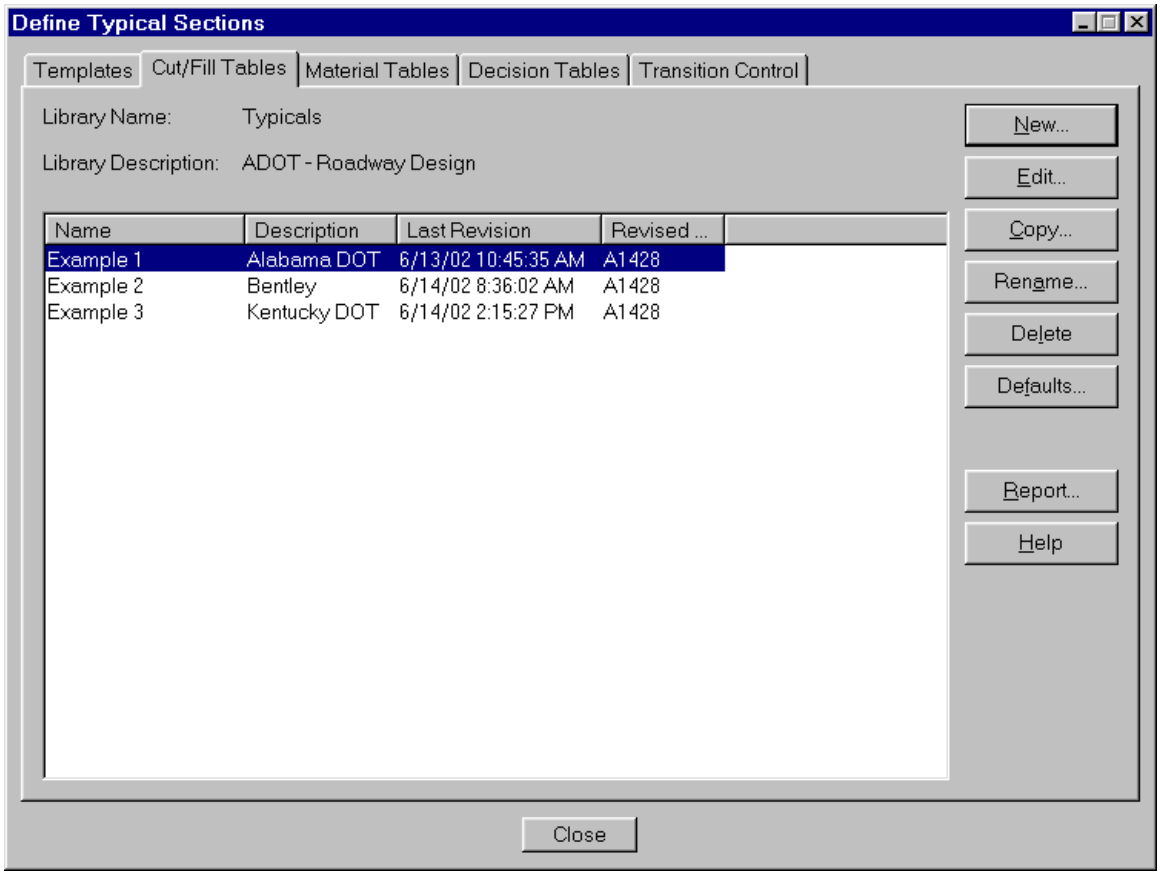
Segment (HF)
This entry starts at **Hinge=(H)** on the template backbone and seeks to intersect the target DTM with a –16.667% (-6:1) slope extending a maximum distance of 48.00’, which would define a T.C. point called **Fill=(F)**. if an intersection is encountered, then the intercept point will be a vertex defining the daylight point/fill line for the project.

Segment (HG)
This entry starts at **Hinge=(H)** on the template backbone and establishes a temporary point called **t=(G)** a horizontal distance of 48.00'. No attempt is being made to intersect the target. The next line is then evaluated.

Segment (GI)
This entry starts at the previously defined point **t=(G)** and seeks to intersect the target DTM with a –240,000% slope extending a maximum horizontal distance of .01'. If you limit the horizontal distance to .01', the maximum vertical distance that this slope can extend is –24.00'. If this segment intersects the target DTM, then a segment is generated from **Hinge=(H)** to Variable **Fill=(I)**. If an intersection is encountered, then the intercept point will be a vertex defining the daylight point/fill line for the project. If an intersection is not encountered, then the next line is evaluated.

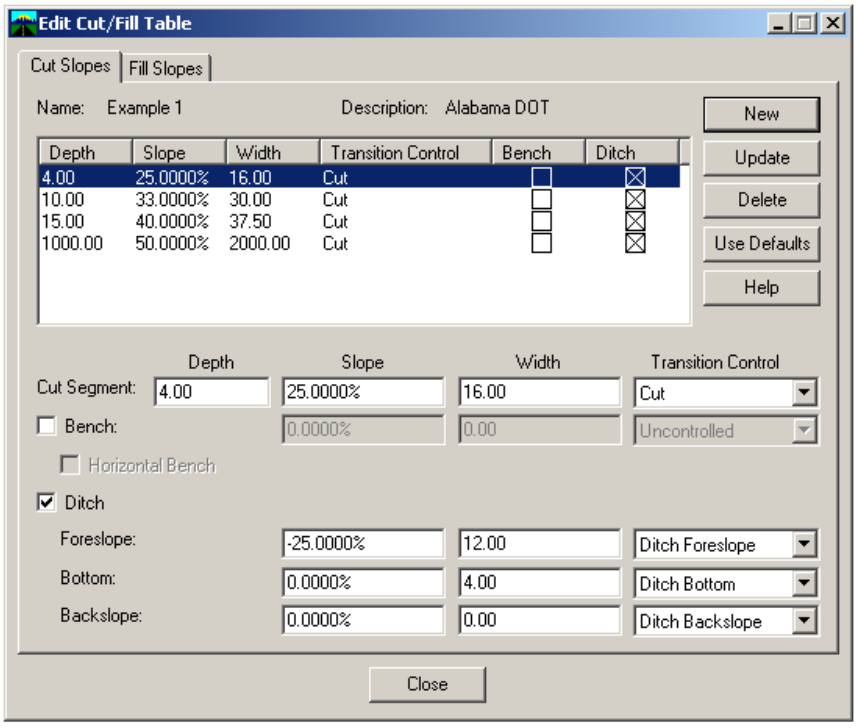
Segment (HJ)
This entry starts at **Hinge=(H)** on the template backbone and seeks to intersect the target DTM with a –50% (-2:1) slope extending a maximum distance of 500.00', which would define **Fill=(J)**.

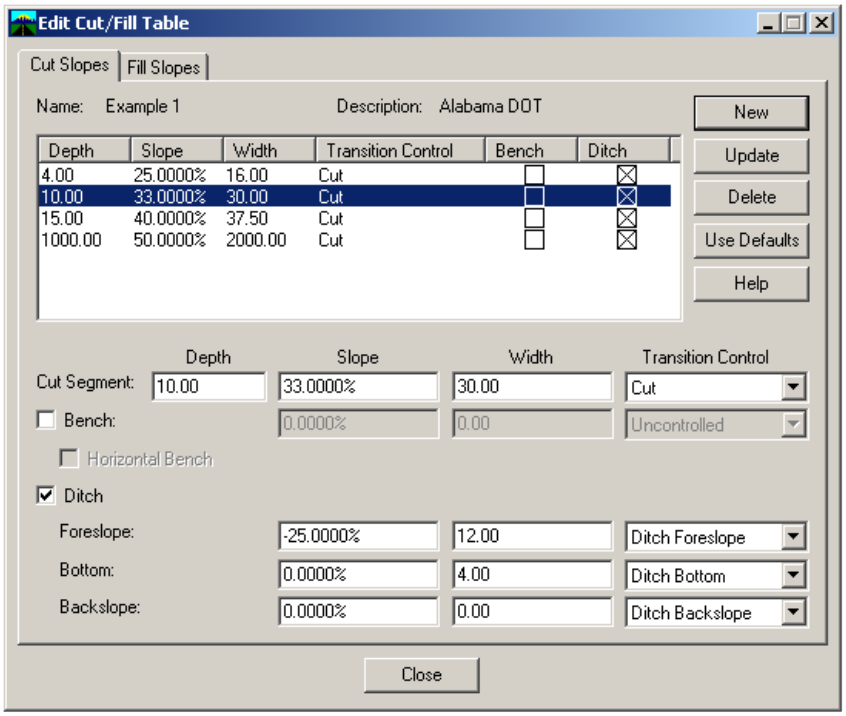
EXAMPLE CUT AND FILL TABLES

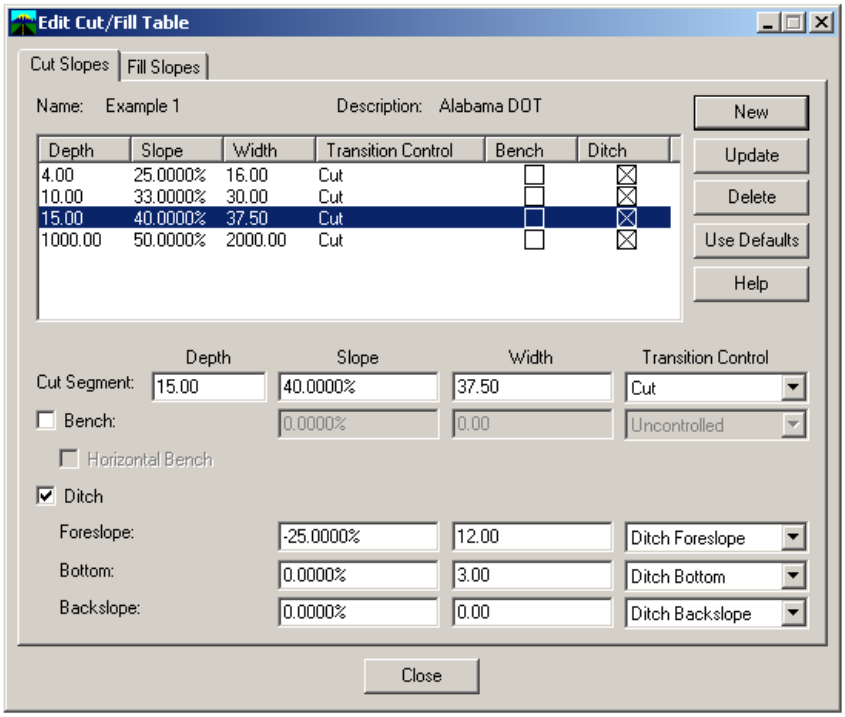


Example Cut and Fill Table from Alabama DOT

Cut Table



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Cut Slopes
Fill Slopes
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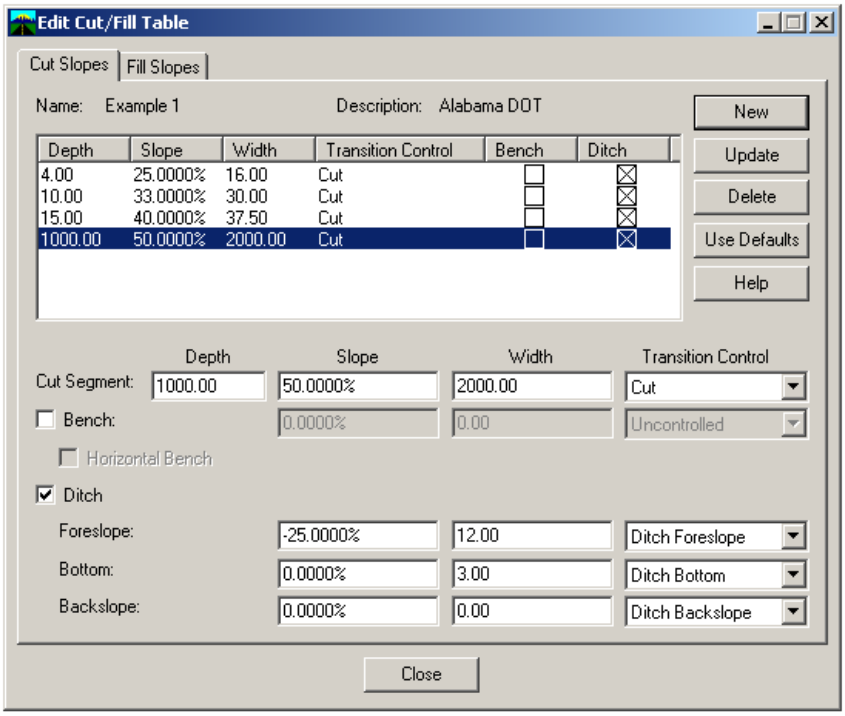
New
Update
Delete
Use Defaults
Help
Depth
Slope
Width
Transition Control
Bench
Ditch
4.00 25.0000% 16.00 Cut
10.00 33.0000% 30.00 Cut
15.00 40.0000% 37.50 Cut
1000.00 50.0000% 2000.00 Cut
Cut Segment: 15.00 40.0000% 37.50 Cut
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Ditch
Foreslope: -25.0000% 12.00 Ditch Foreslope
Bottom: 0.0000% 3.00 Ditch Bottom
Backslope: 0.0000% 0.00 Ditch Backslope
Close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Fill Slopes
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Delete
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Help
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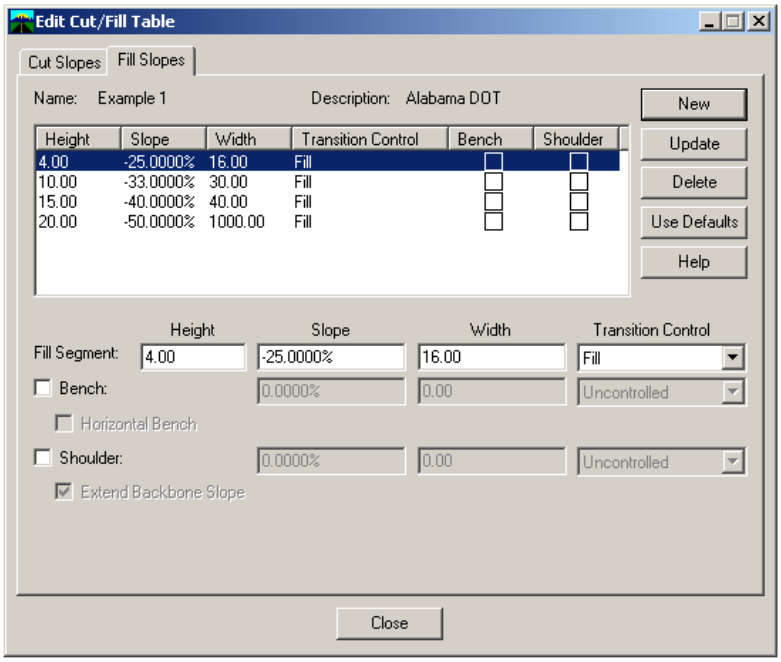
Slope
Width
Transition Control
Bench
Ditch
4.00 25.0000% 16.00 Cut
10.00 33.0000% 30.00 Cut
15.00 40.0000% 37.50 Cut
1000.00 50.0000% 2000.00 Cut
Cut Segment: 1000.00 50.0000% 2000.00 Cut
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Ditch
Foreslope: -25.0000% 12.00 Ditch Foreslope
Bottom: 0.0000% 3.00 Ditch Bottom
Backslope: 0.0000% 0.00 Ditch Backslope
Close

Fill Table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Help
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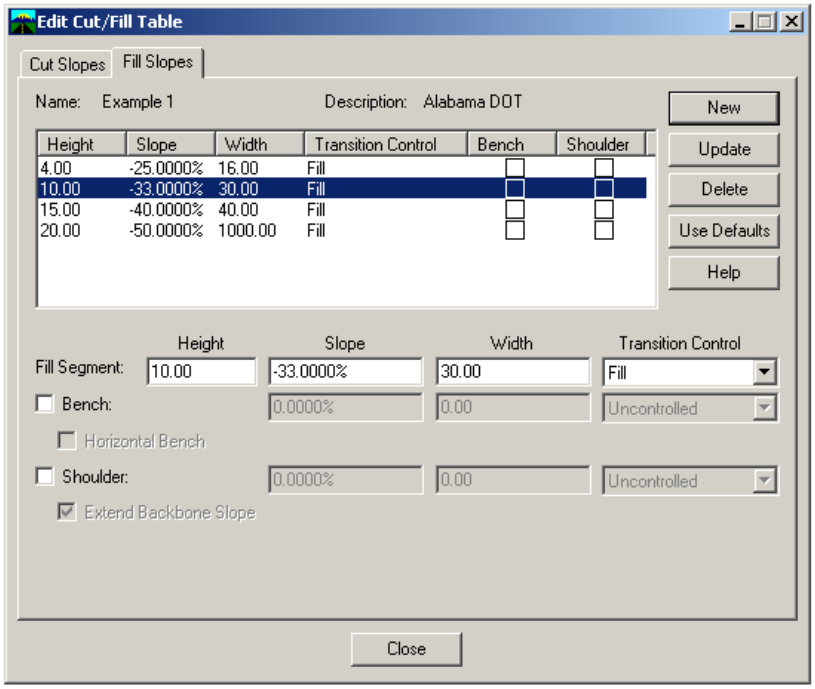
15.00 -40.0000% 40.00 Fill
20.00 -50.0000% 1000.00 Fill
Height Slope Width Transition Control
Fill Segment: 4.00 -25.0000% 16.00 Fill
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Shoulder: 0.0000% 0.00 Uncontrolled
Extend Backbone Slope
Close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Fill Slopes
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Delete
Use Defaults
Help
Height Slope Width Transition Control Bench Shoulder
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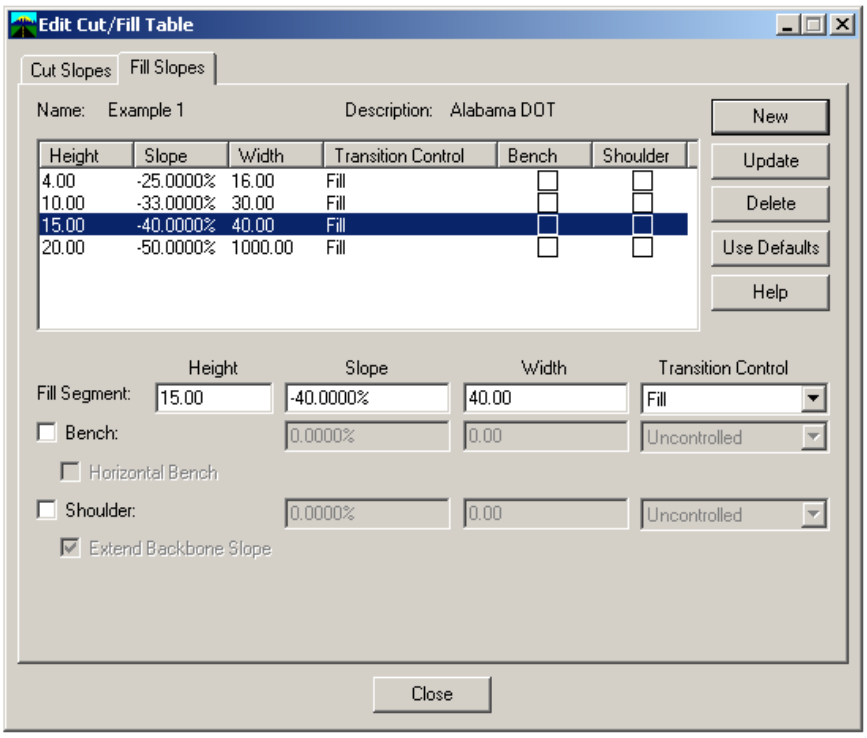
10.00 -33.0000% 30.00 Fill
15.00 -40.0000% 40.00 Fill
20.00 -50.0000% 1000.00 Fill
Height Slope Width Transition Control
Fill Segment: 10.00 -33.0000% 30.00 Fill
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Shoulder: 0.0000% 0.00 Uncontrolled
Extend Backbone Slope
Close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Slope
Width
Transition Control
Bench
Shoulder
4.00 -25.0000% 16.00 Fill
10.00 -33.0000% 30.00 Fill
15.00 -40.0000% 40.00 Fill
20.00 -50.0000% 1000.00 Fill
Fill Segment:
15.00
-40.0000%
40.00
Fill
Bench:
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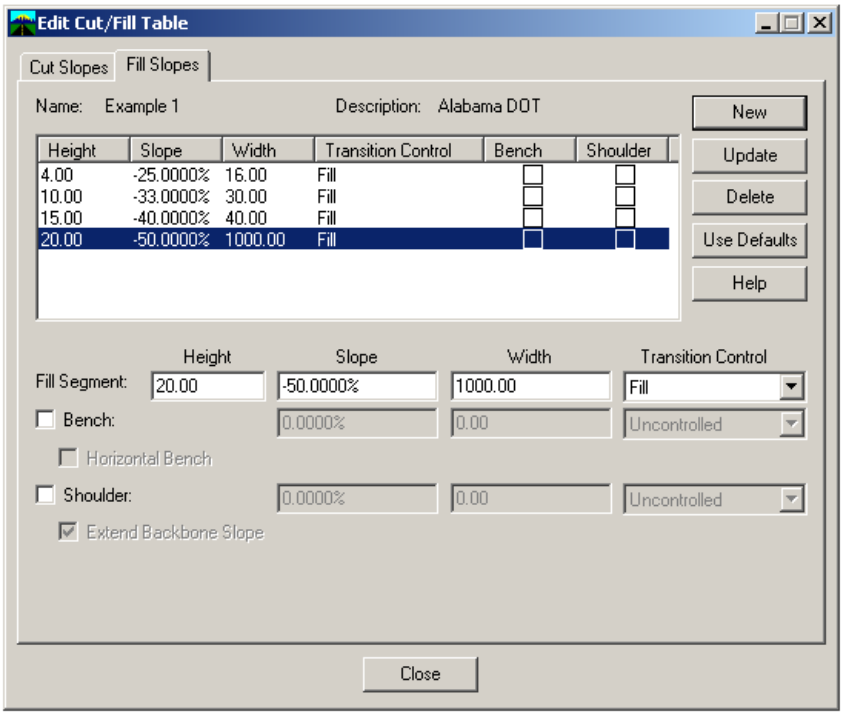
0.00
Uncontrolled
Horizontal Bench
Shoulder:
0.0000%
0.00
Uncontrolled
Extend Backbone Slope
Close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Help
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Width
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Bench
Shoulder
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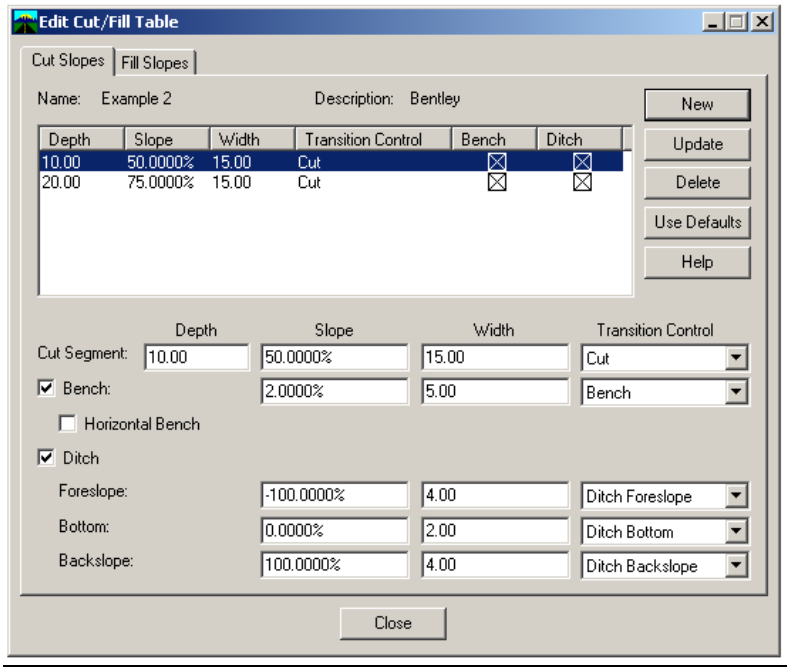
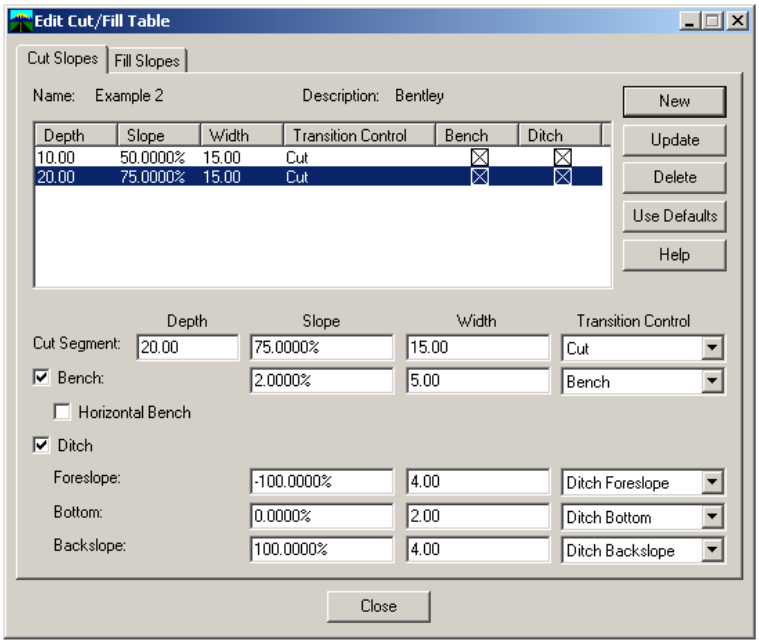
10.00 -33.0000% 30.00 Fill
15.00 -40.0000% 40.00 Fill
20.00 -50.0000% 1000.00 Fill
Fill Segment:
20.00
-50.0000%
1000.00
Fill
Bench:
0.0000%
0.00
Uncontrolled
Horizontal Bench
Shoulder:
0.0000%
0.00
Uncontrolled
Extend Backbone Slope
Close

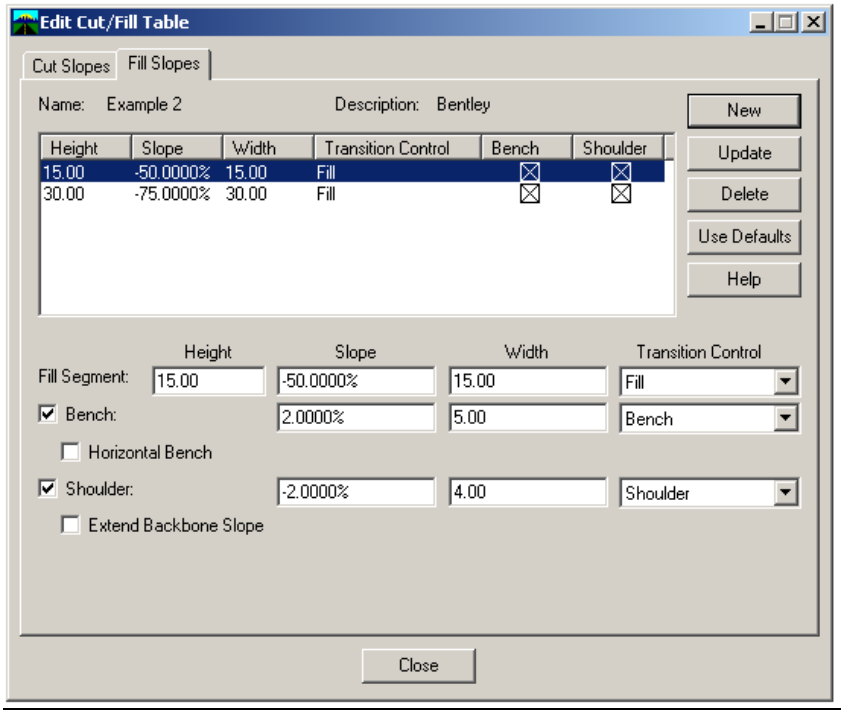
Example Cut and Fill Table from Bentley

Cut Table





Fill Table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Fill Slopes
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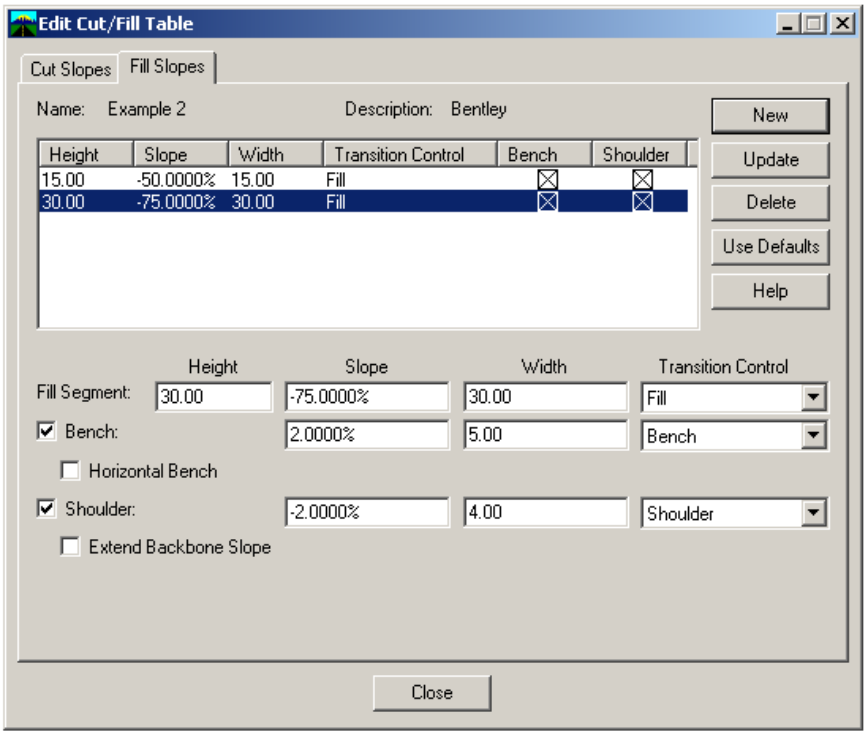
Use Defaults
Help
Height
Slope
Width
Transition Control
Bench
Shoulder
15.00 -50.0000% 15.00 Fill
30.00 -75.0000% 30.00 Fill
Height
Slope
Width
Transition Control
Fill Segment: 15.00 -50.0000% 15.00 Fill
Bench: 2.0000% 5.00 Bench
Horizontal Bench
Shoulder: -2.0000% 4.00 Shoulder
Extend Backbone Slope
Close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Fill Slopes
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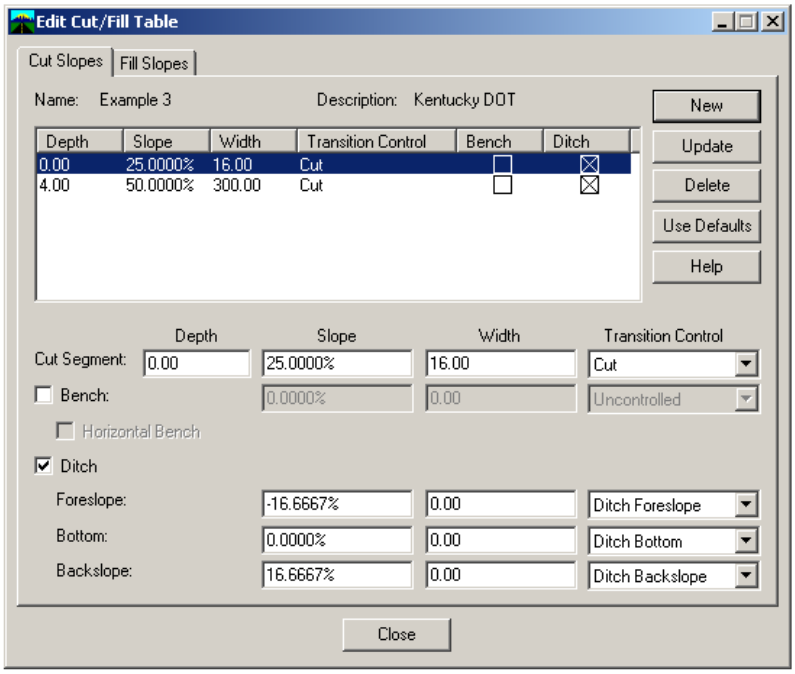
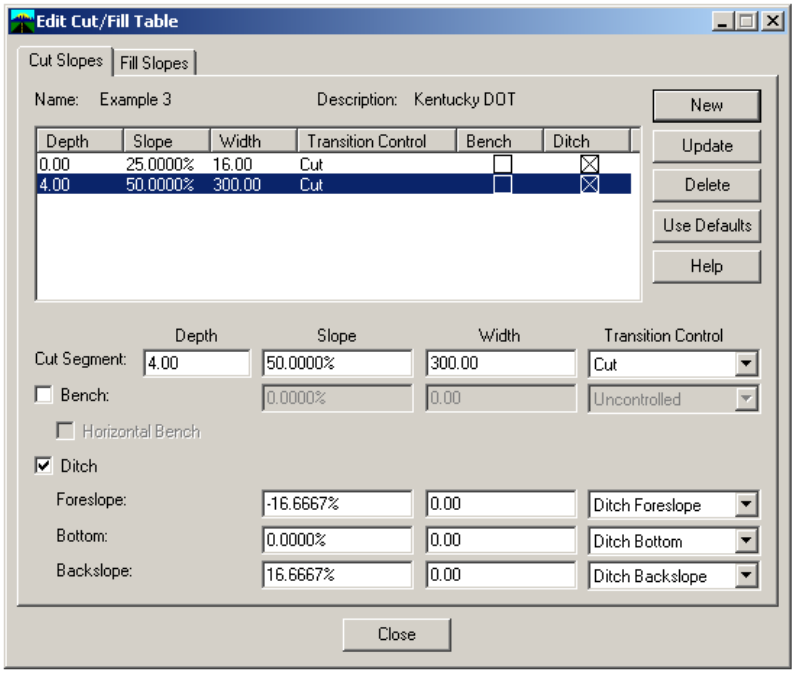
New
Update
Delete
Use Defaults
Help
Height
Slope
Width
Transition Control
Bench
Shoulder
15.00 -50.0000% 15.00 Fill
30.00 -75.0000% 30.00 Fill
Height
Slope
Width
Transition Control
Fill Segment: 30.00 -75.0000% 30.00 Fill
Bench: 2.0000% 5.00 Bench
Horizontal Bench
Shoulder: -2.0000% 4.00 Shoulder
Extend Backbone Slope
Close

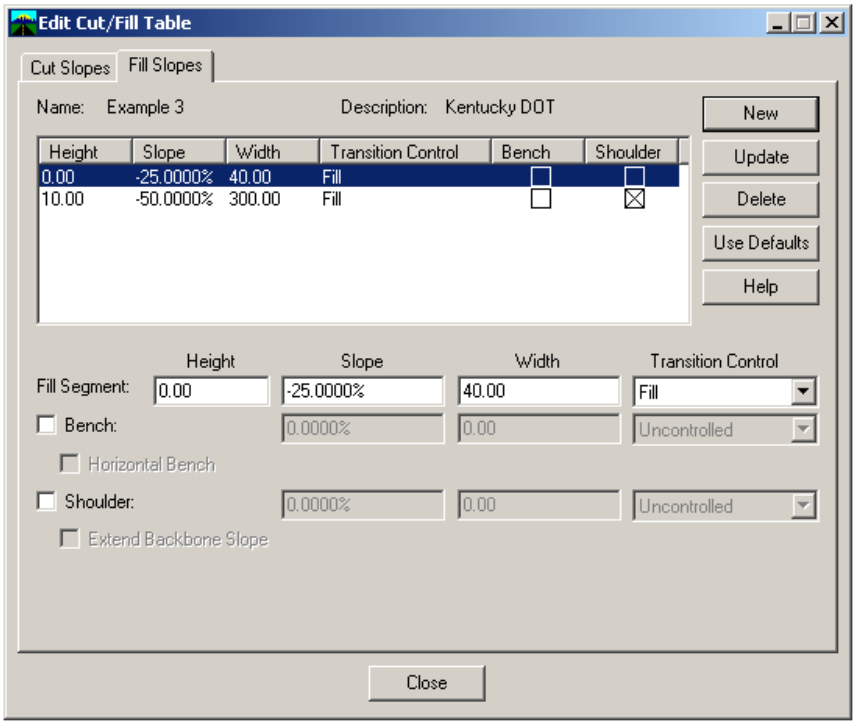
Example Cut and Fill Table from Kentucky DOT

Cut Table





Fill Table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Fill Slopes
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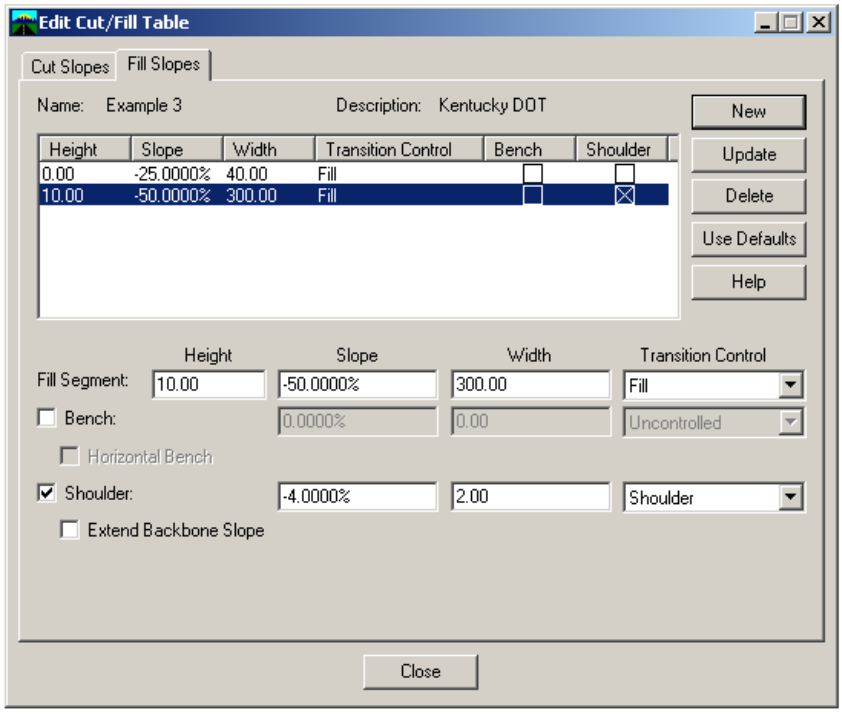
Use Defaults
Help
Height
Slope
Width
Transition Control
Bench
Shoulder
0.00 -25.0000% 40.00 Fill
10.00 -50.0000% 300.00 Fill
Fill Segment: 0.00 -25.0000% 40.00 Fill
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Shoulder: 0.0000% 0.00 Uncontrolled
Extend Backbone Slope
Close


Edit Cut/Fill Table
Cut Slopes
Fill Slopes
Name: Example 3
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New
Update
Delete
Use Defaults
Help
Height
Slope
Width
Transition Control
Bench
Shoulder
0.00 -25.0000% 40.00 Fill
10.00 -50.0000% 300.00 Fill
Fill Segment: 10.00 -50.0000% 300.00 Fill
Bench: 0.0000% 0.00 Uncontrolled
Horizontal Bench
Shoulder: -4.0000% 2.00 Shoulder
Extend Backbone Slope
Close

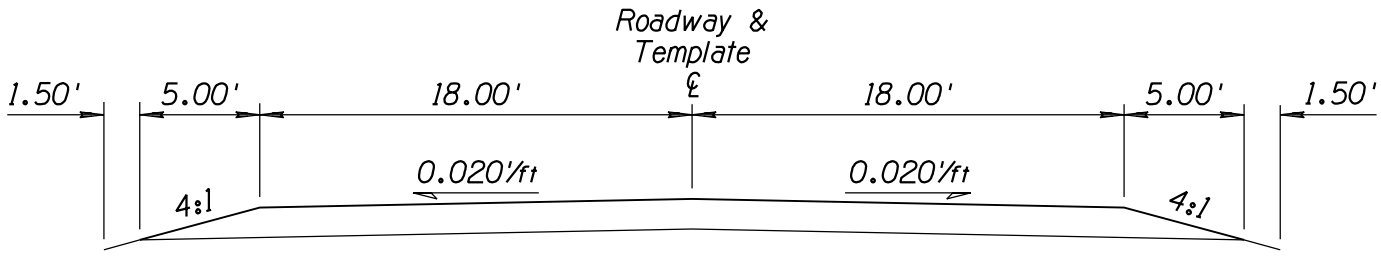
FREQUENTLY ASKED QUESTIONS:

Question: Can I use more than one decision table on my project?
Answer: Yes. All decision tables and templates have to be in one library, but different ones can be used at different locations on the project. Simply define which template and decision table to use in your Roadway Definitions.

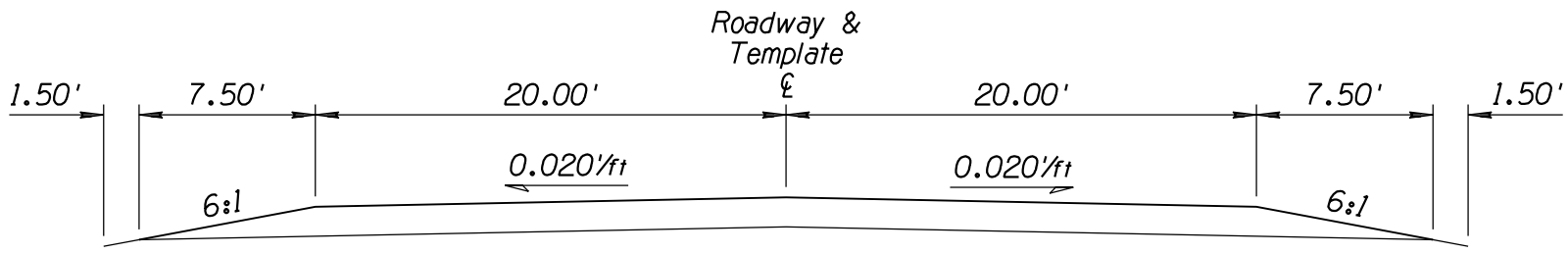
Question: I want to use decision table C-02.20, but my maximum fill slope needs to be -2:1 instead of –1½:1, what do I need to do?
Answer: A variable slope held to a maximum distance of 48.00' and a maximum slope of 2:1 would have a maximum height of 24.00'. You will need to change **Segment (GI)** so that the slope from **t=(G)** to **Fill=(I)** is –24,000% **Segment (HJ)** will have to be changed so that the slope from **Hinge=(H)** to **Fill(J)** is –50%.

Question: I want to use decision table C-02.20, but my cut ditch is 20.00' wide instead of 15'. What has to be changed?
Answer: On **Segment (HA)**, change the segment width from 6.00' to 11.00'.

Question: What happens if no intersection is encountered with the target DTM?
Answer: Verify the limits of the DTM to insure there has been enough information collected. Revise the maximum decision table intercept distance. Review the Template/Roadway Definition.

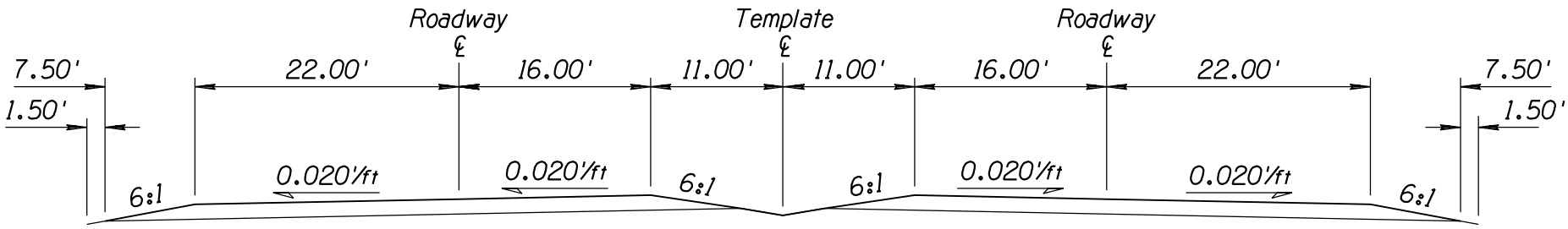


RC
TYPICAL SECTION
Rural 36' Section

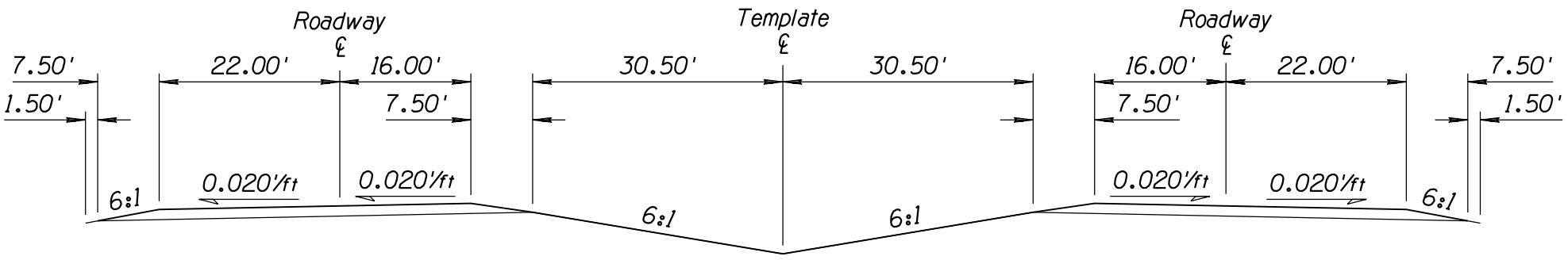


RB
TYPICAL SECTION
Rural 40' Section

Figure A1

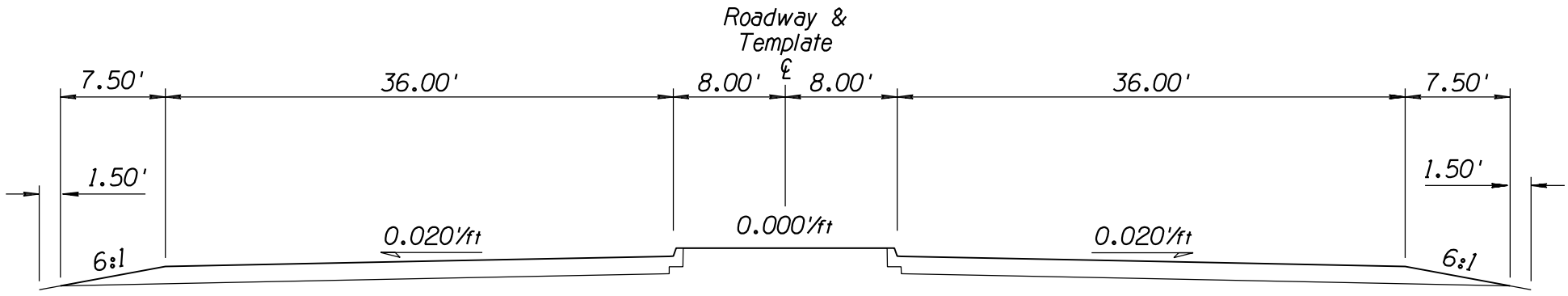


IS3
TYPICAL SECTION
Interstate Section 4-Lane Divided with Uncurbed, Unpaved Median

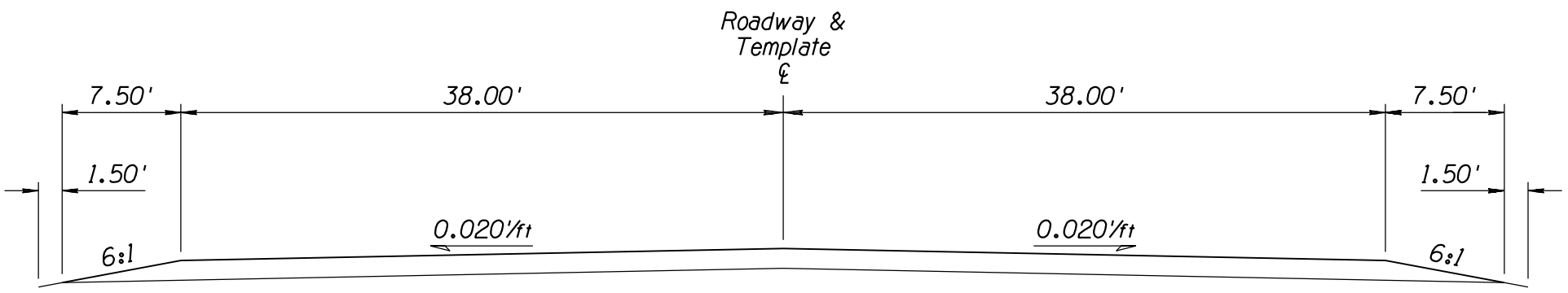


RA
TYPICAL SECTION
Rural Dual Road Section

Figure A2

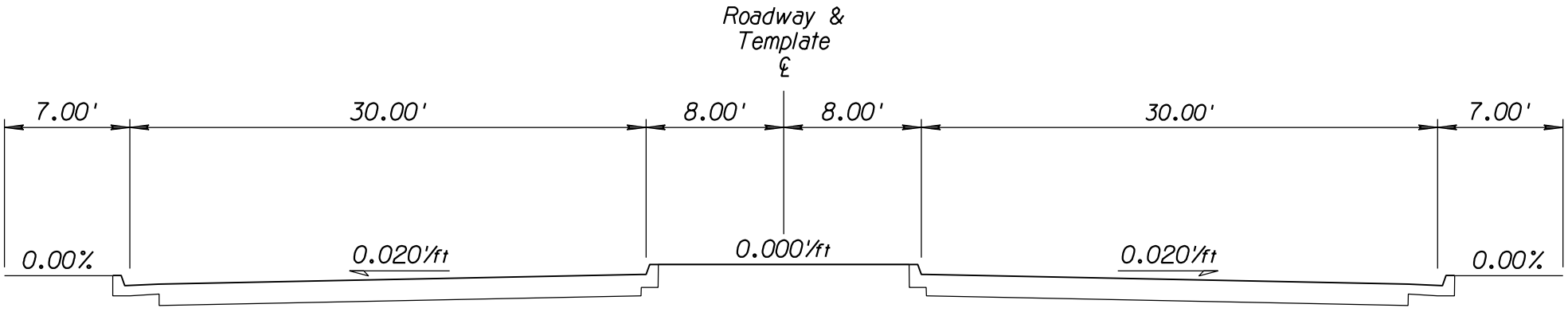


IS1
TYPICAL SECTION
Interstate Section 4-Lane
with Curbed (Type G) Median

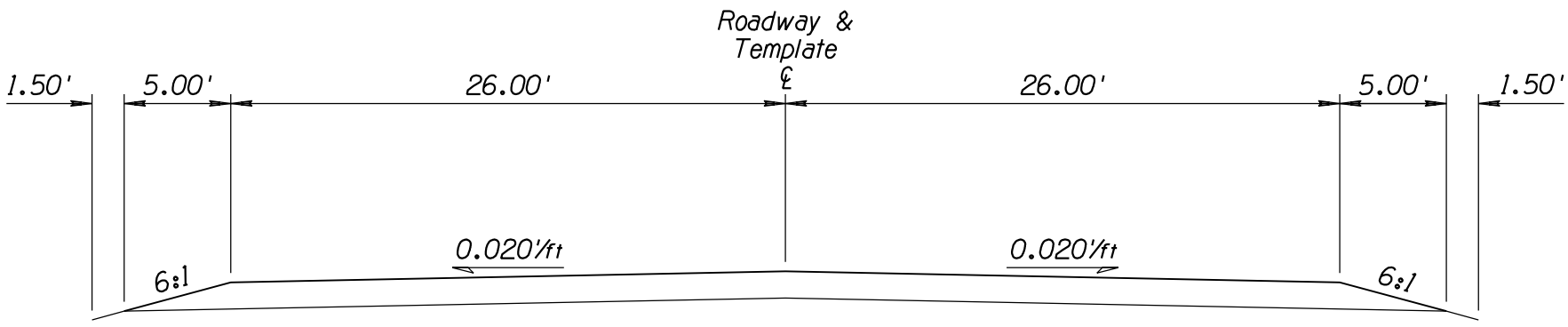


IS2
TYPICAL SECTION
Interstate Section 4-Lane
with Flush Median

Figure A3

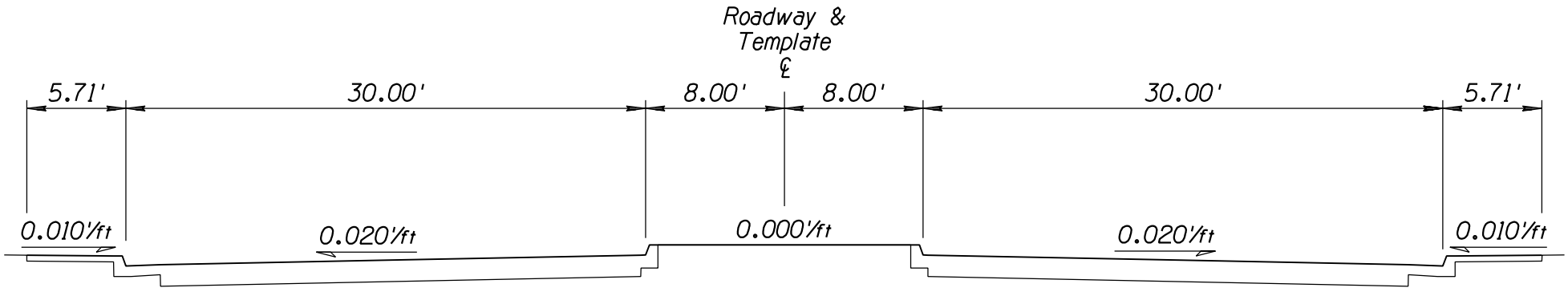


UA
TYPICAL SECTION
Urban Arterial 4-Lane
with Raised Median

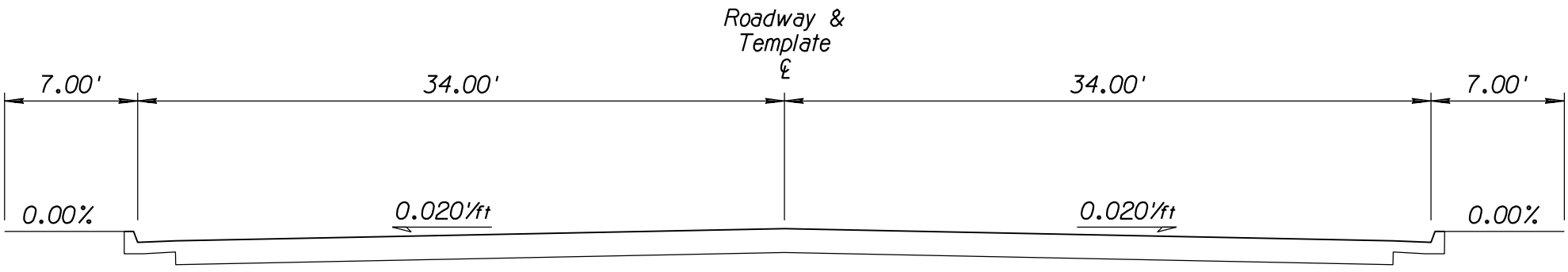


UC
TYPICAL SECTION
Urban Arterial 48' Section

Figure A4

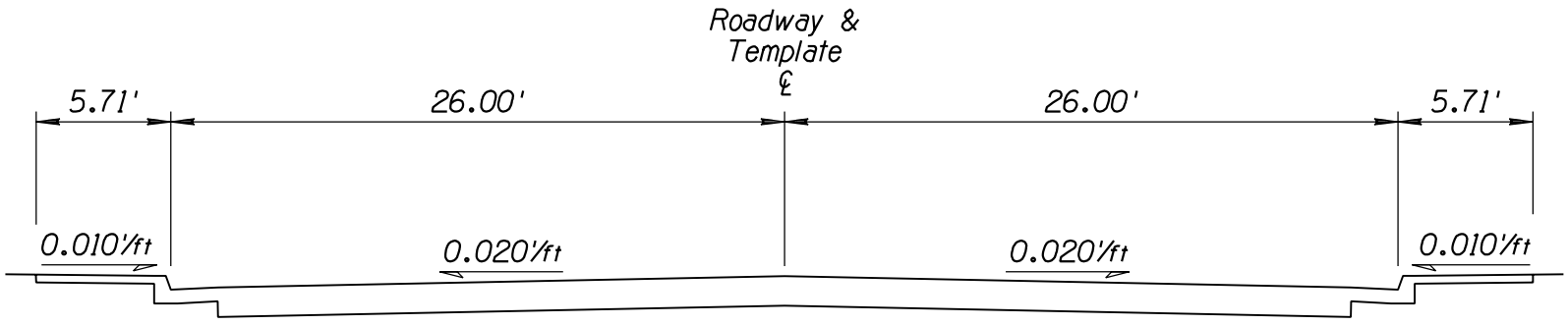


UA with Sidewalk
TYPICAL SECTION
Urban Arterial 4-Lane
with Raised Median and Sidewalk

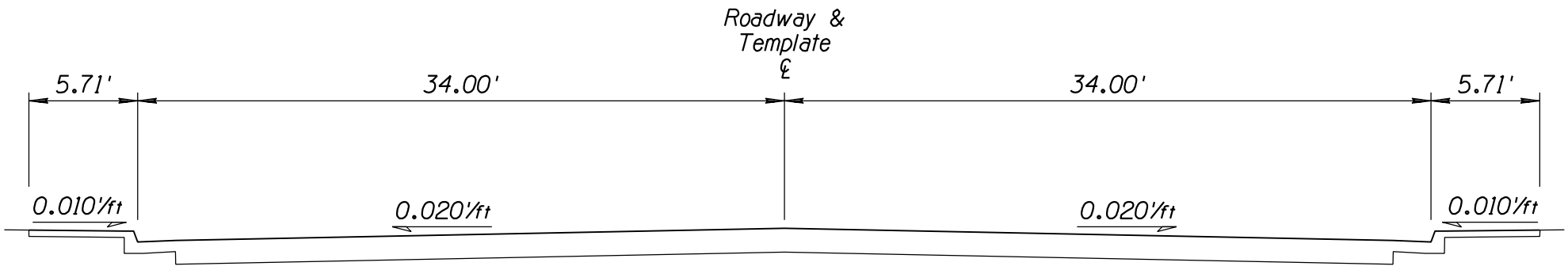


UB
TYPICAL SECTION
Urban Arterial 4-Lane
with Flush Median

Figure A5

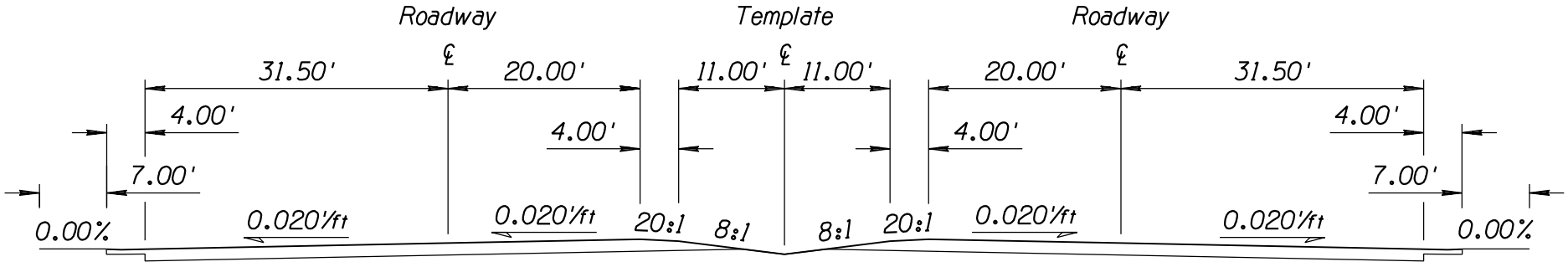


UC with Sidewalk
TYPICAL SECTION
Urban Arterial 48' Section with Sidewalk

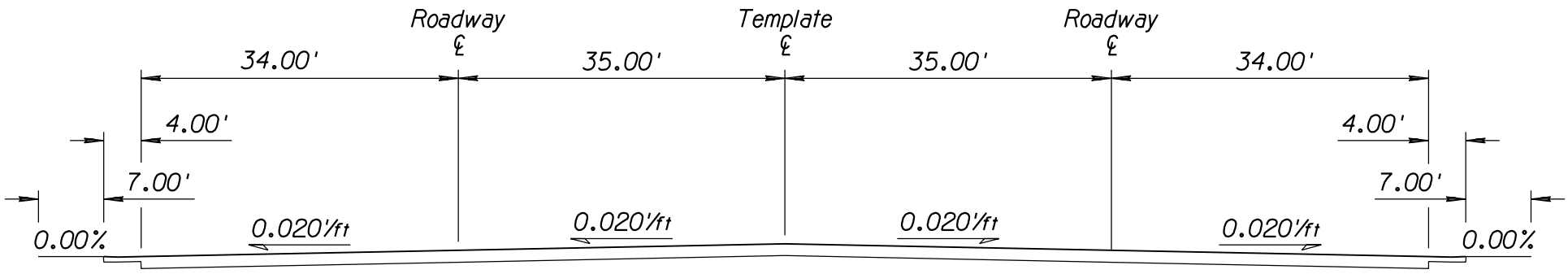


UB with Sidewalk
TYPICAL SECTION
Urban Arterial 4-Lane
with Flush Median and Sidewalk

Figure A6

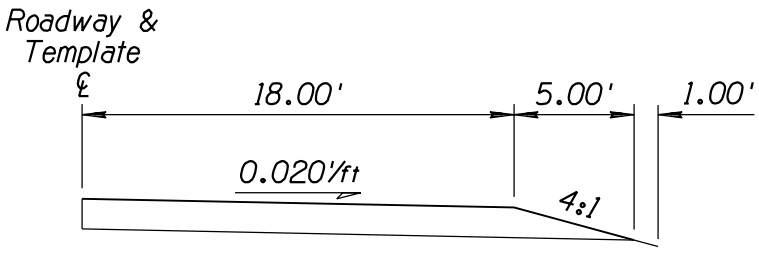


UD (2)
TYPICAL SECTION
Urban Freeway Interim Facility
Normal Crown

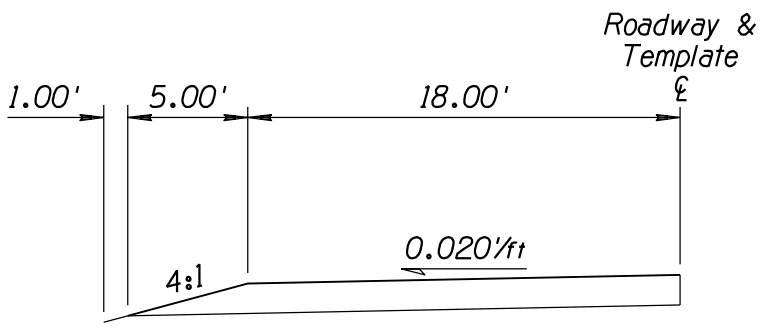


UD (1)
TYPICAL SECTION
Urban Freeway Ultimate Facility
Normal Crown

Figure A7

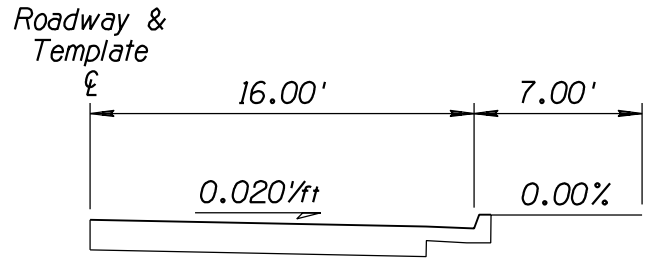


Widen Right
TYPICAL SECTION
Sawcut and Widen (18' Right)

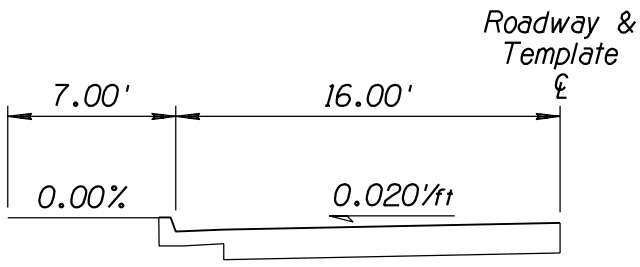


Widen Left
TYPICAL SECTION
Sawcut and Widen (18' Left)

Figure A8



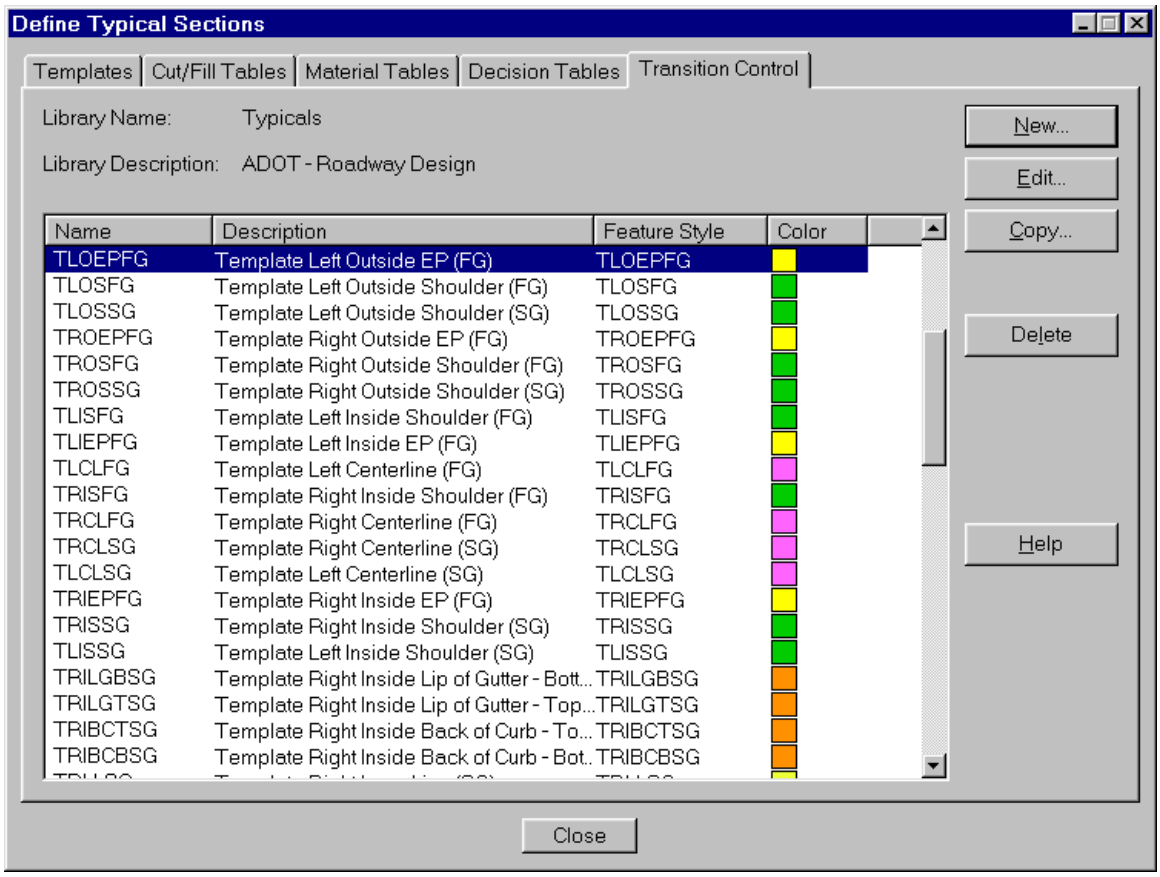
Widen Right with Curb
TYPICAL SECTION
Sawcut and Widen (16' Right) with Curb



Widen Left with Curb
TYPICAL SECTION
Sawcut and Widen (16' Left) with Curb

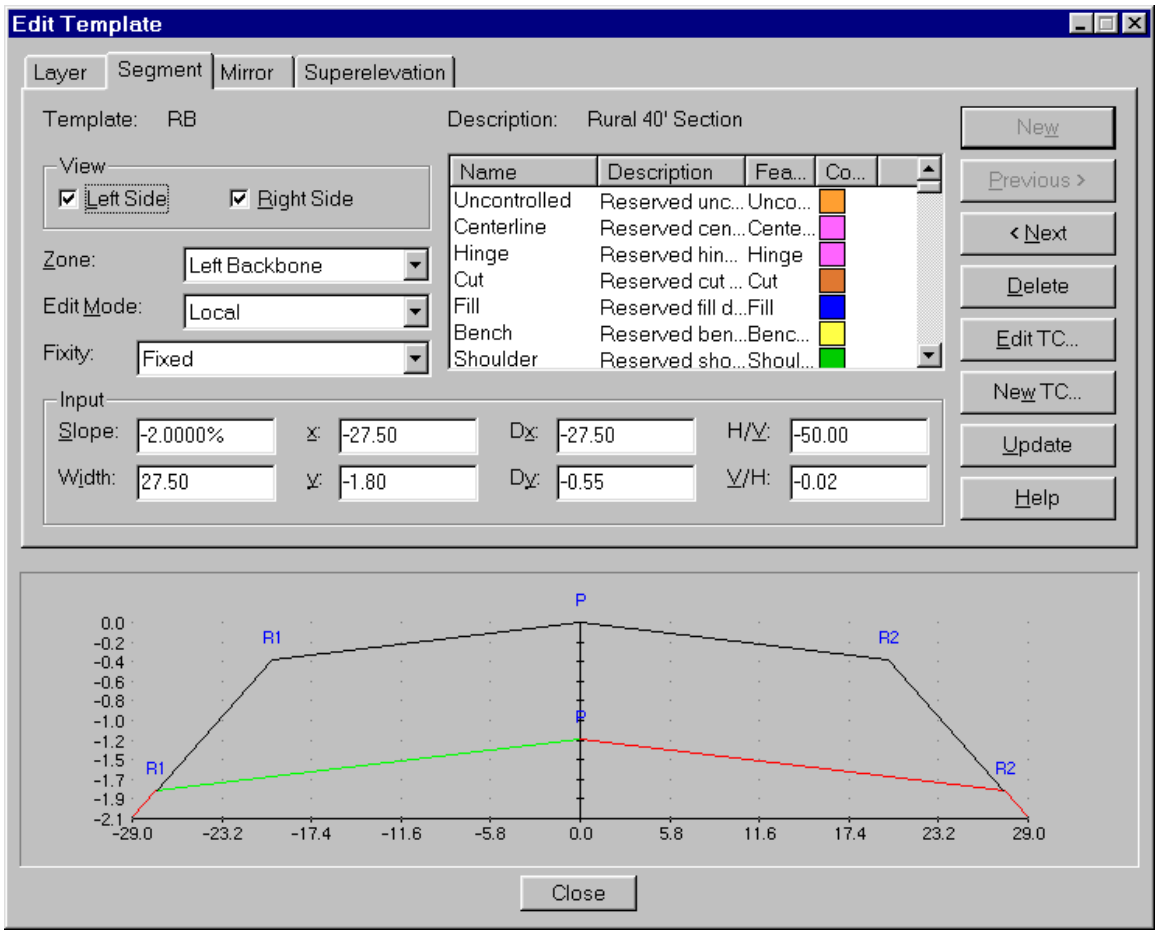
Figure A9

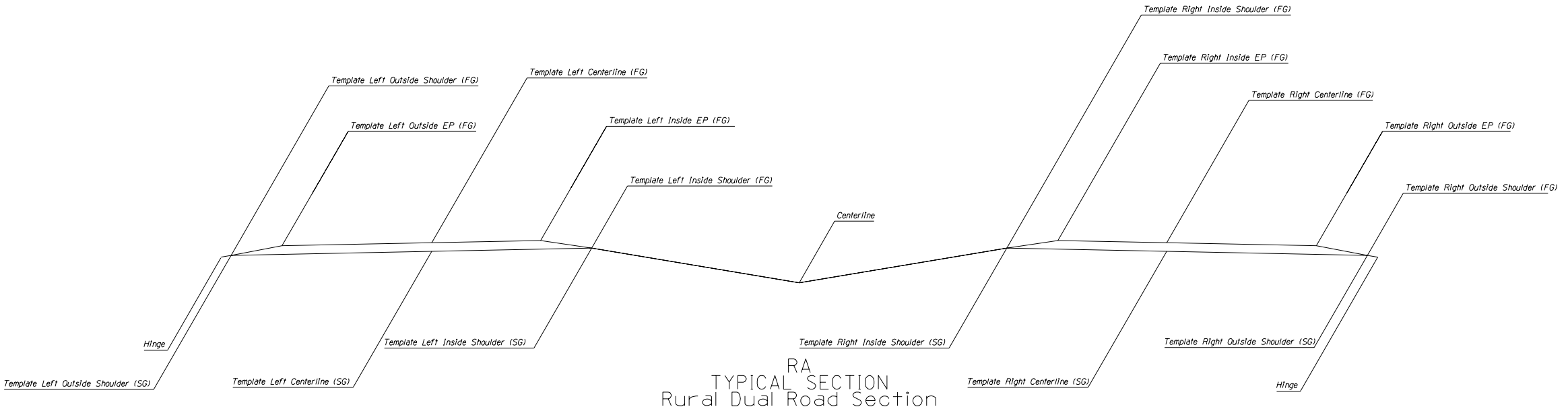
TEMPLATE SEGMENT NAMES



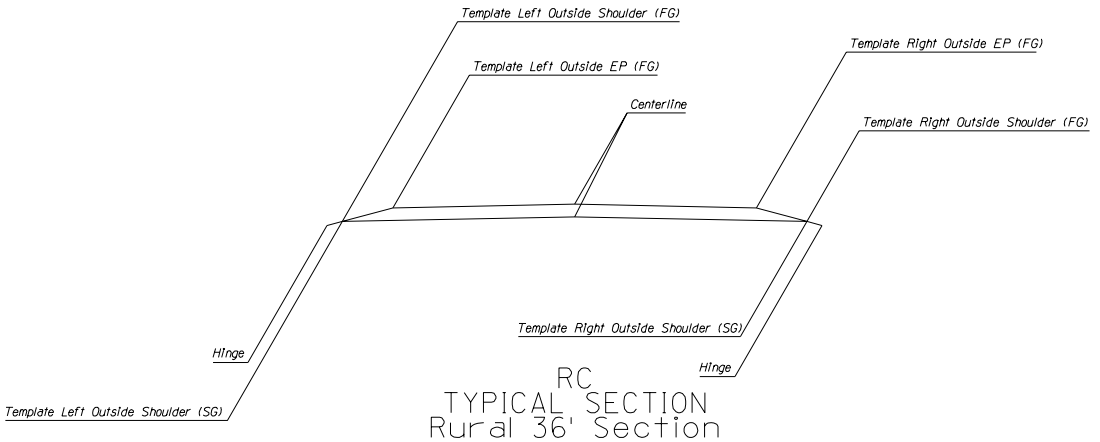
Name	Description	Feature Style	Color
TLOEPFG	Template Left Outside EP (FG)	TLOEPFG	
TLOSFG	Template Left Outside Shoulder (FG)	TLOSFG	
TLOSSG	Template Left Outside Shoulder (SG)	TLOSSG	
TROEPFG	Template Right Outside EP (FG)	TROEPFG	
TROSFG	Template Right Outside Shoulder (FG)	TROSFG	
TROSSG	Template Right Outside Shoulder (SG)	TROSSG	
TLISFG	Template Left Inside Shoulder (FG)	TLISFG	
TLIEPFG	Template Left Inside EP (FG)	TLIEPFG	
TLCLFG	Template Left Centerline (FG)	TLCLFG	
TRISFG	Template Right Inside Shoulder (FG)	TRISFG	
TRCLFG	Template Right Centerline (FG)	TRCLFG	
TRCLSG	Template Right Centerline (SG)	TRCLSG	
TLCLSG	Template Left Centerline (SG)	TLCLSG	
TRIEPFG	Template Right Inside EP (FG)	TRIEPFG	
TRISSG	Template Right Inside Shoulder (SG)	TRISSG	
TLISSG	Template Left Inside Shoulder (SG)	TLISSG	
TRILGBSG	Template Right Inside Lip of Gutter - Bott...	TRILGBSG	
TRILGTSG	Template Right Inside Lip of Gutter - Top...	TRILGTSG	
TRIBCTSG	Template Right Inside Back of Curb - To...	TRIBCTSG	
TRIBCBSG	Template Right Inside Back of Curb - Bot..	TRIBCBSG	

TEMPLATE SLOPES AND DISTANCES

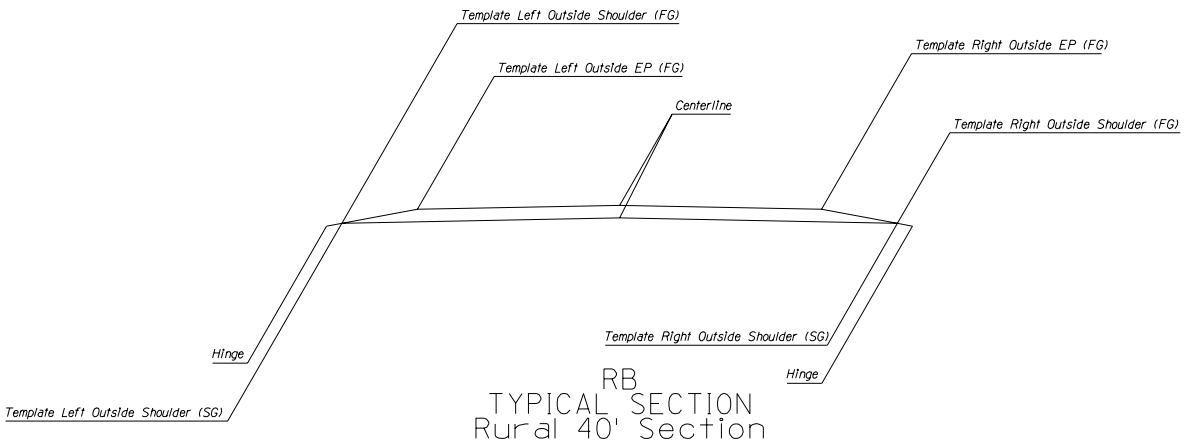




RA
TYPICAL SECTION
Rural Dual Road Section

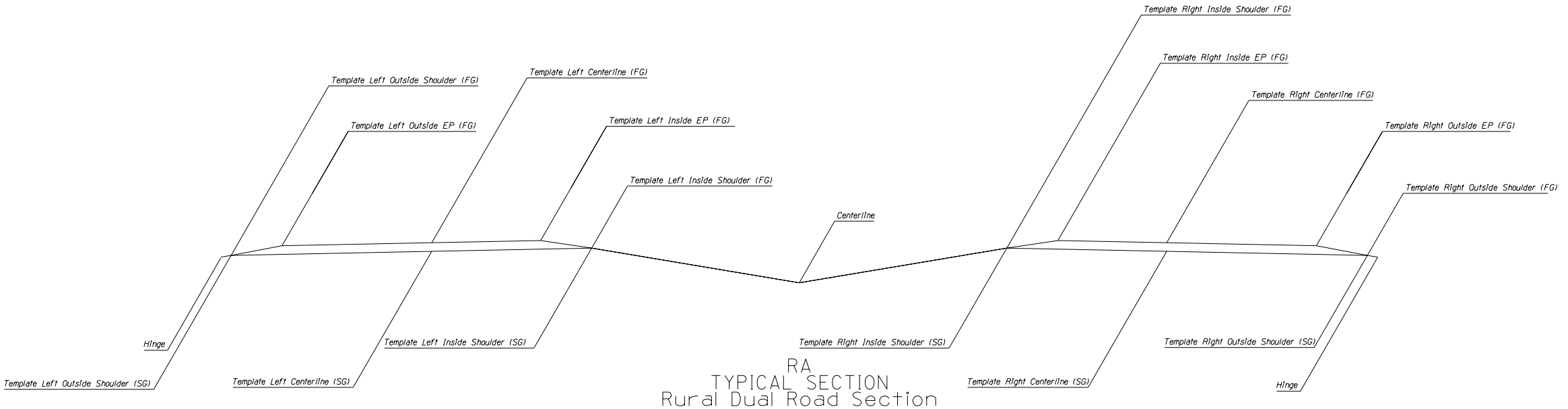


RC
TYPICAL SECTION
Rural 36' Section

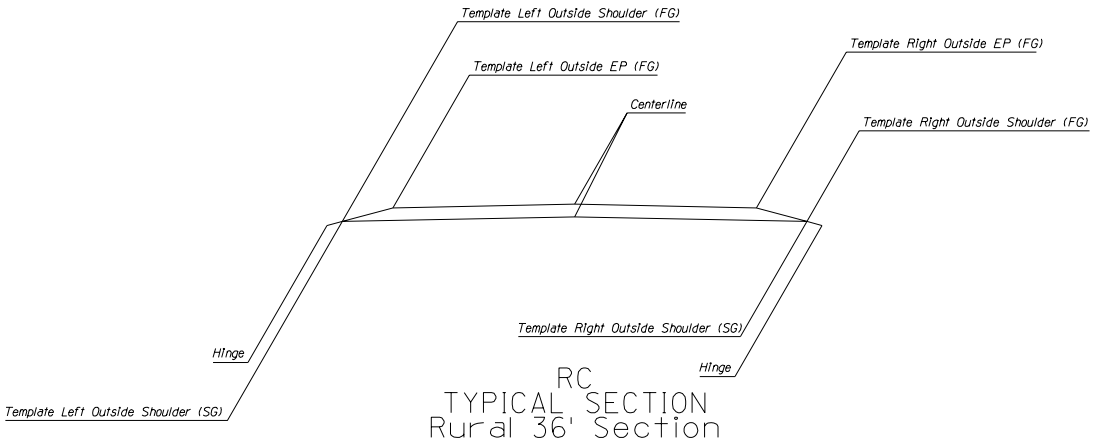


RB
TYPICAL SECTION
Rural 40' Section

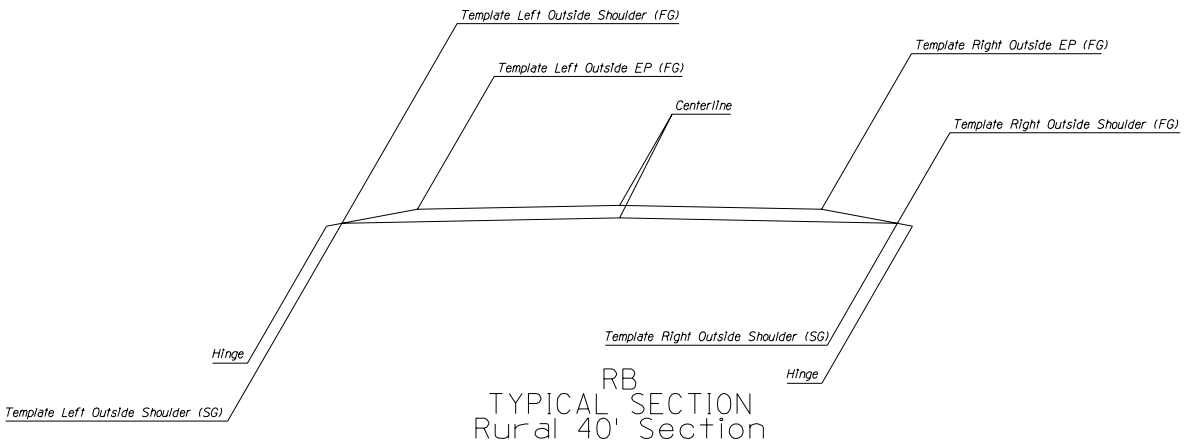
Figure B1



RA
TYPICAL SECTION
Rural Dual Road Section

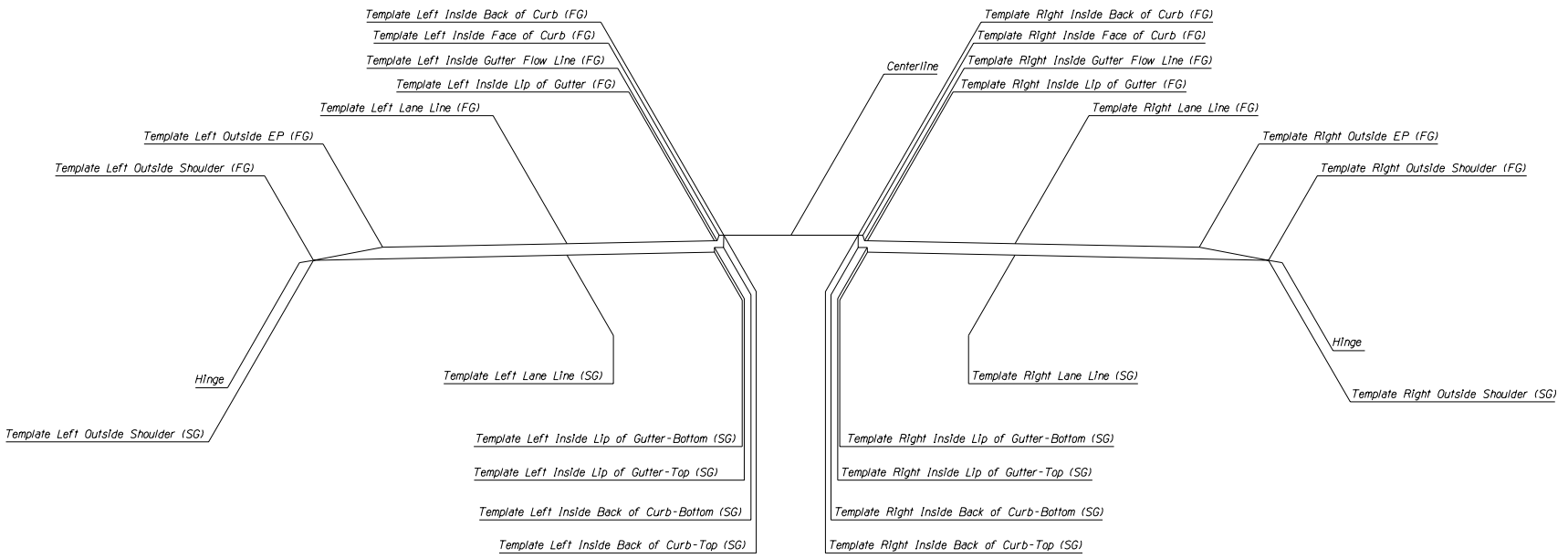


RC
TYPICAL SECTION
Rural 36' Section

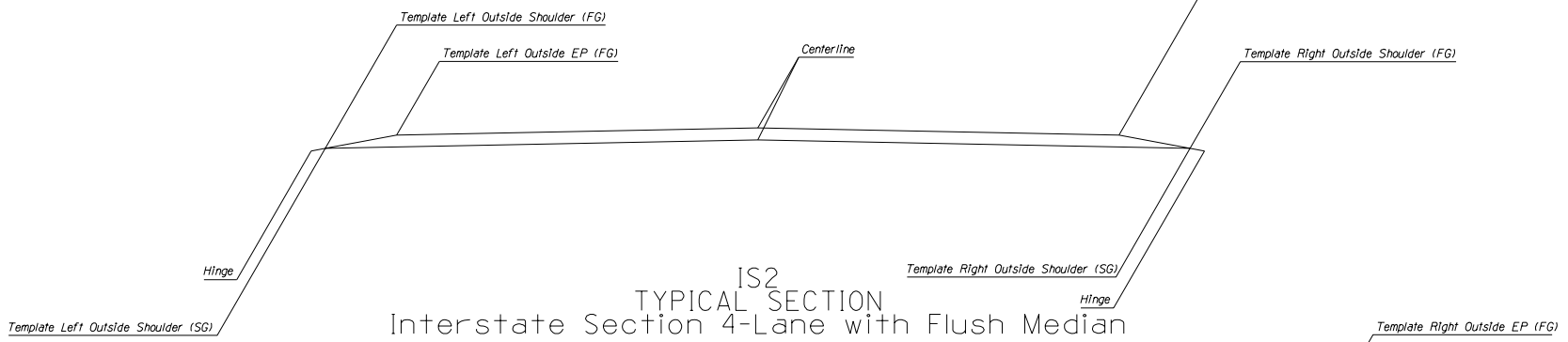


RB
TYPICAL SECTION
Rural 40' Section

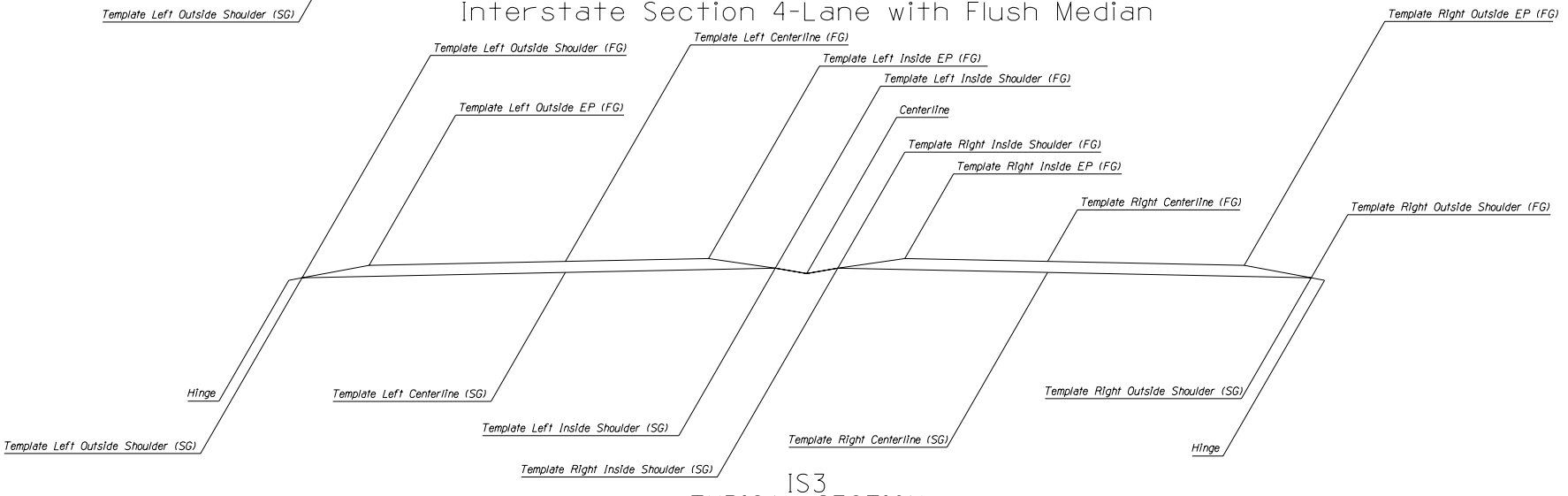
Figure B1



IS1
TYPICAL SECTION
Interstate Section 4-Lane with Curbed (Type G) Median

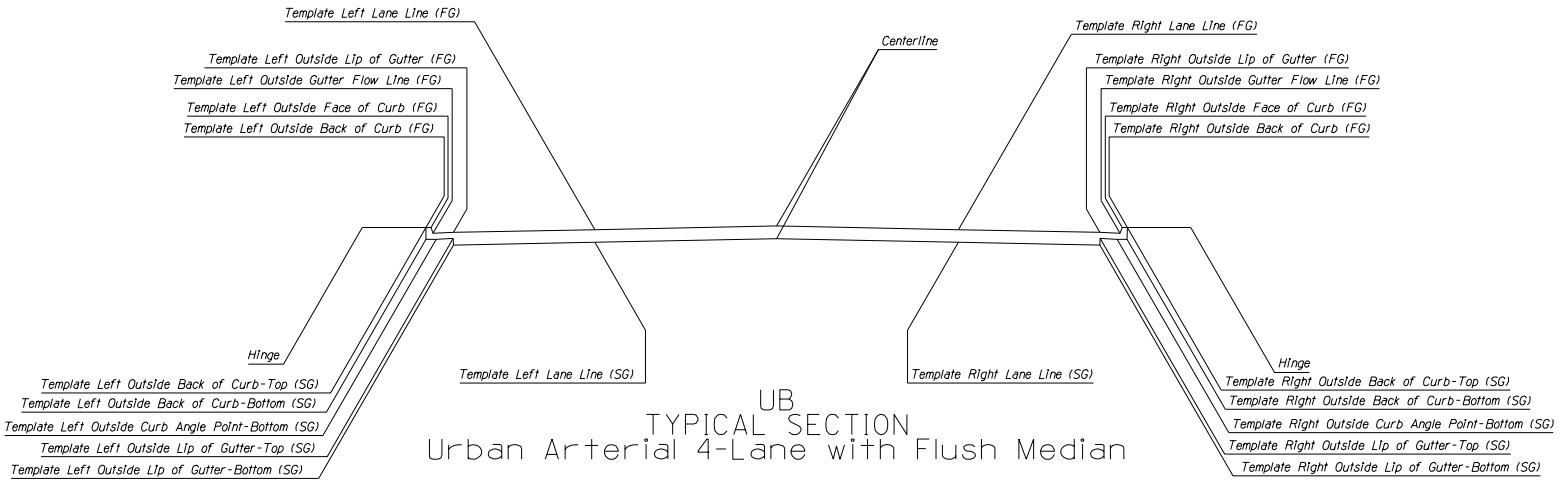


IS2
TYPICAL SECTION
Interstate Section 4-Lane with Flush Median

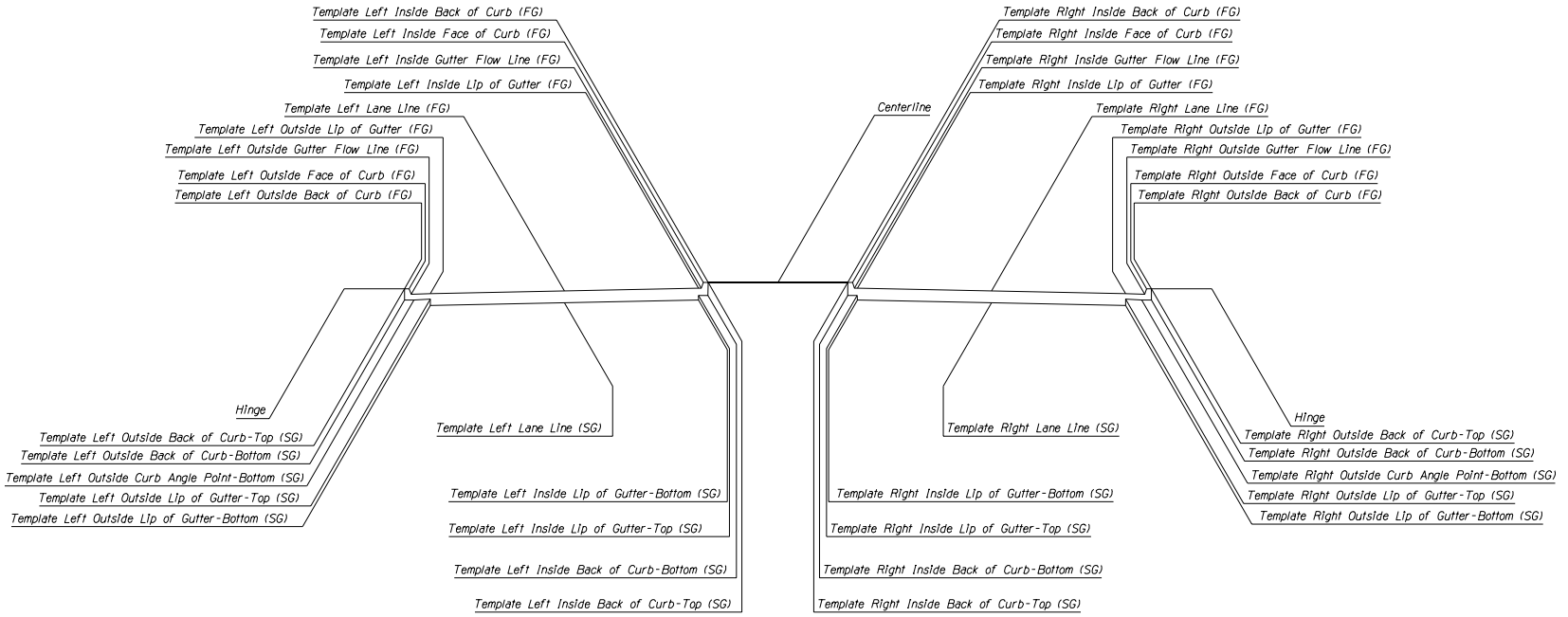


IS3
TYPICAL SECTION
Interstate Section 4-Lane Divided with Uncurbed, Unpaved Median

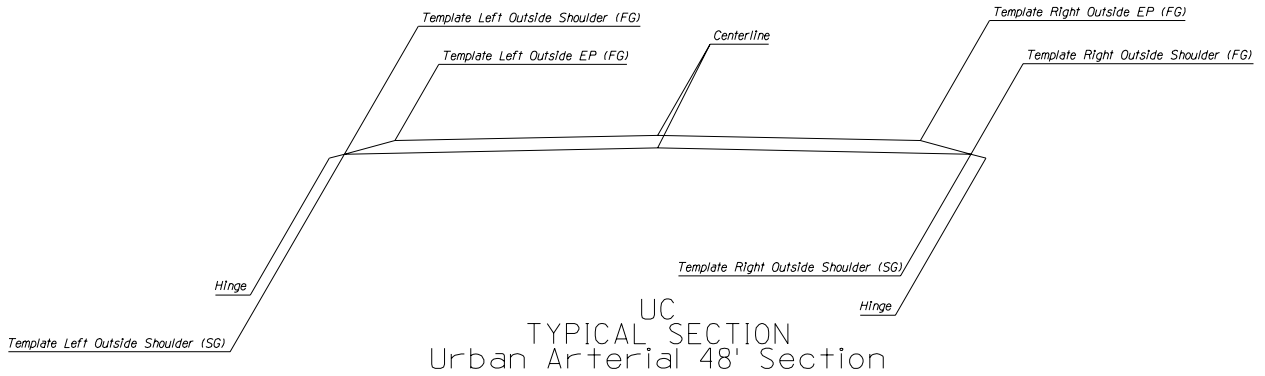
Figure B2



UB
TYPICAL SECTION
Urban Arterial 4-Lane with Flush Median

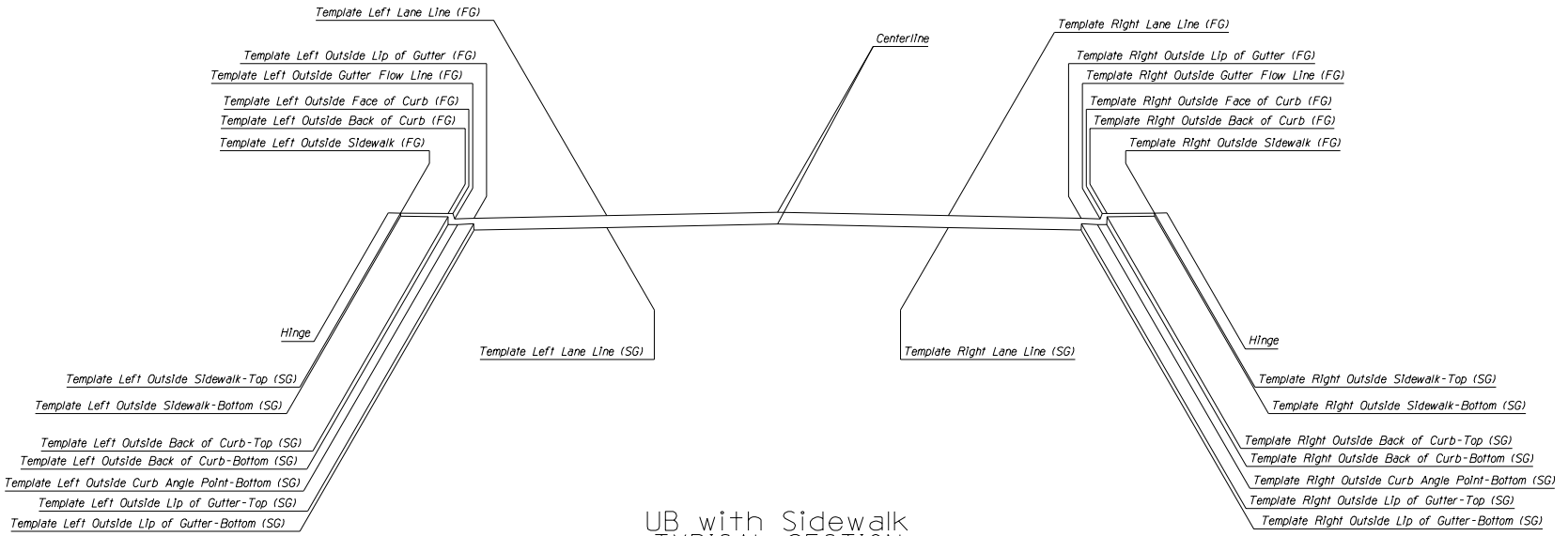


UA
TYPICAL SECTION
Urban Arterial 4-Lane with Raised Median

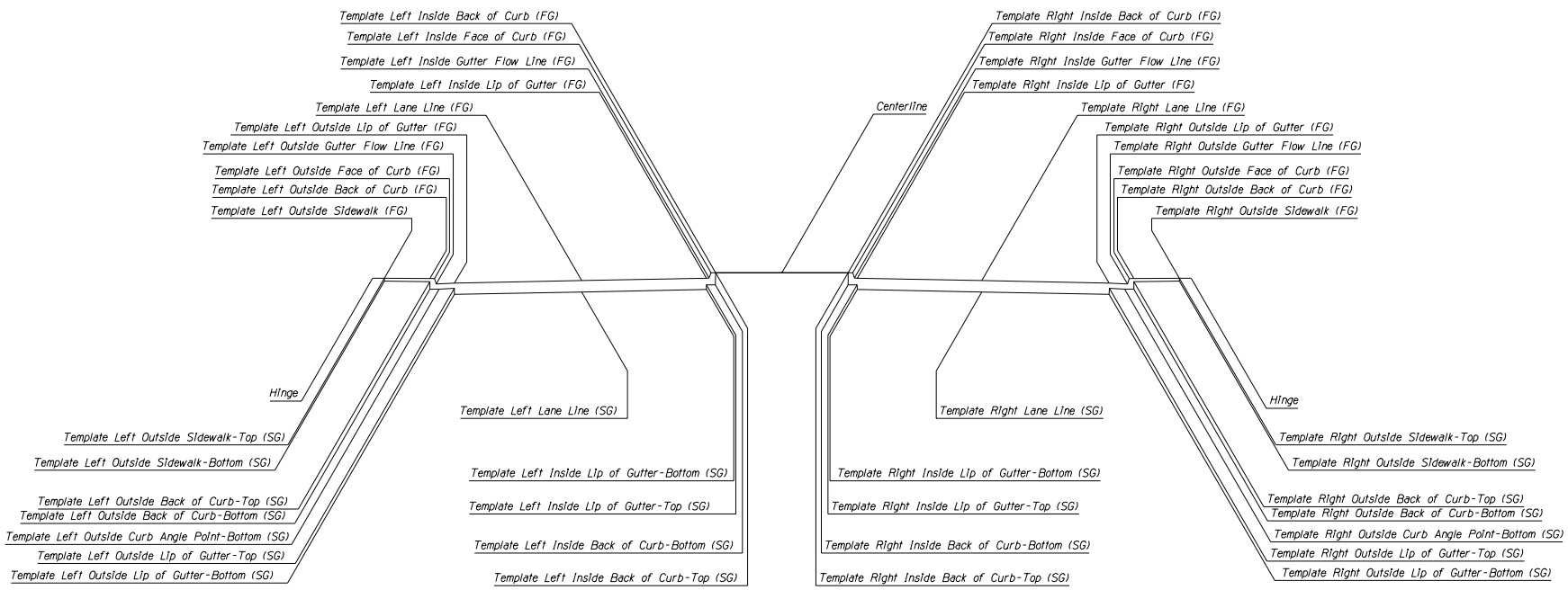


UC
TYPICAL SECTION
Urban Arterial 48' Section

Figure B3

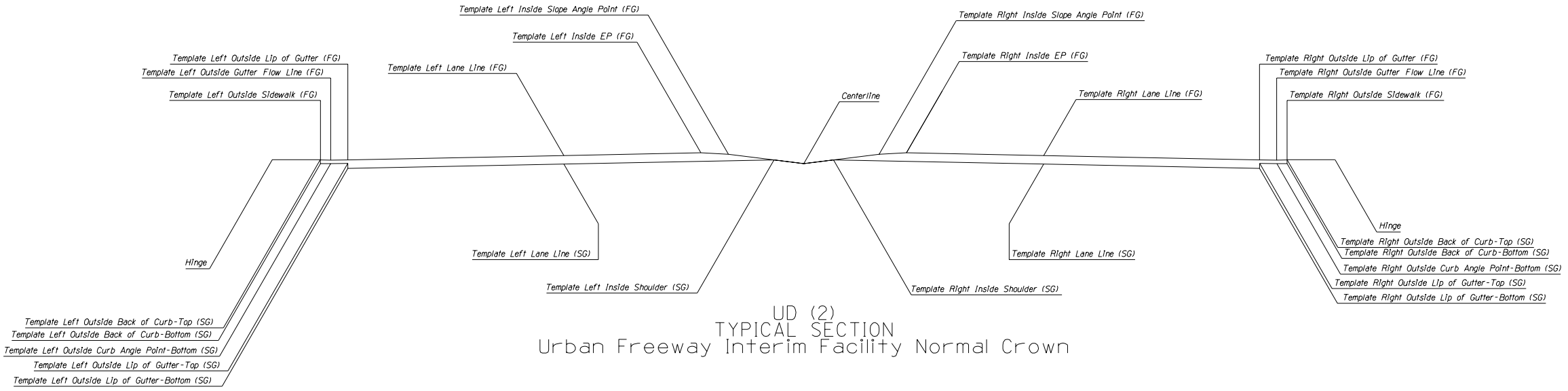


UB with Sidewalk
TYPICAL SECTION
Urban Arterial 4-Lane with Flush Median and Sidewalk

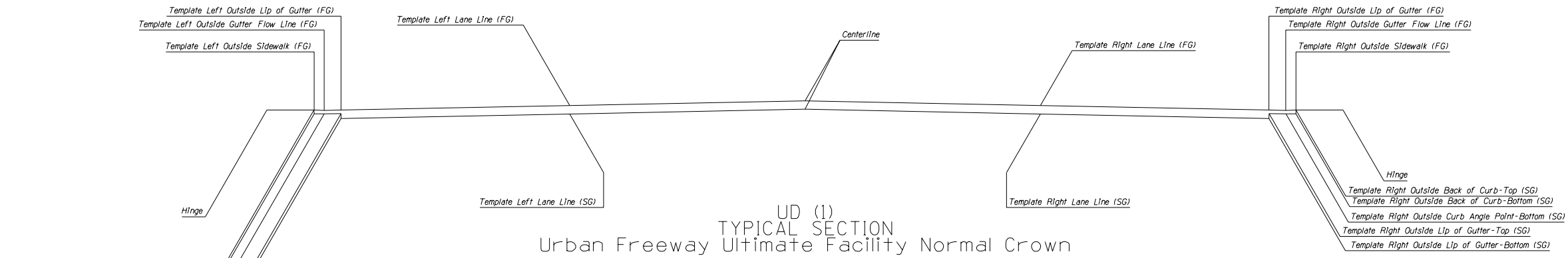


UA with Sidewalk
TYPICAL SECTION
Urban Arterial 4-Lane with Raised Median and Sidewalk

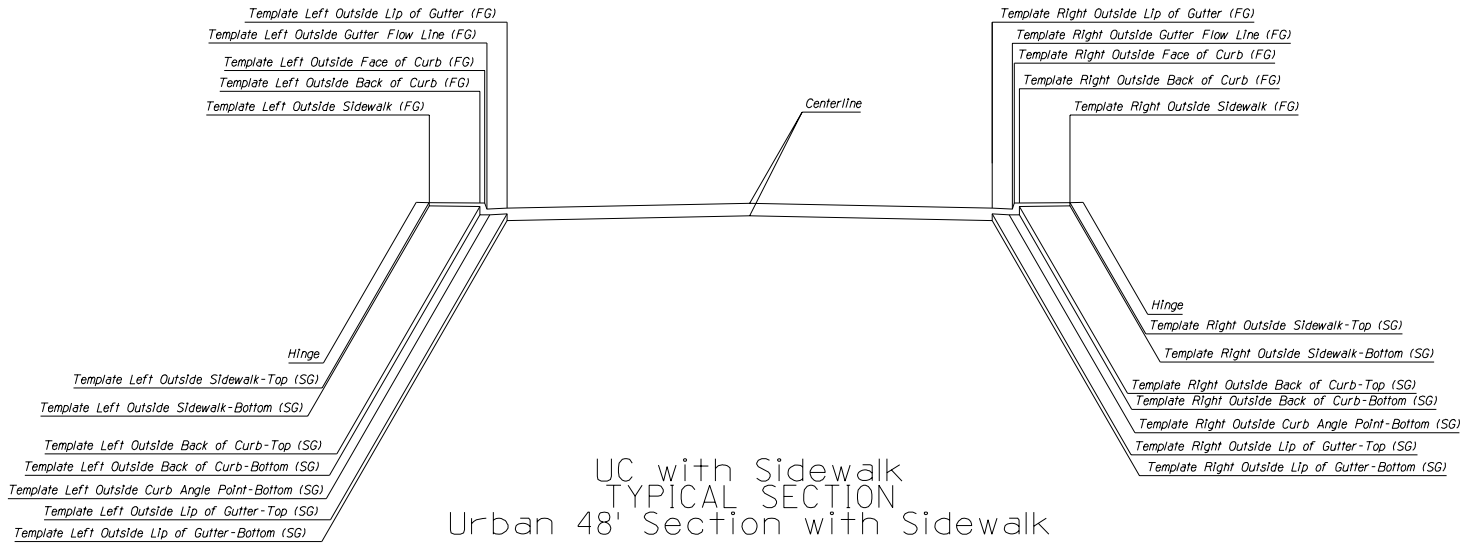
Figure B4



UD (2)
TYPICAL SECTION
Urban Freeway Interim Facility Normal Crown

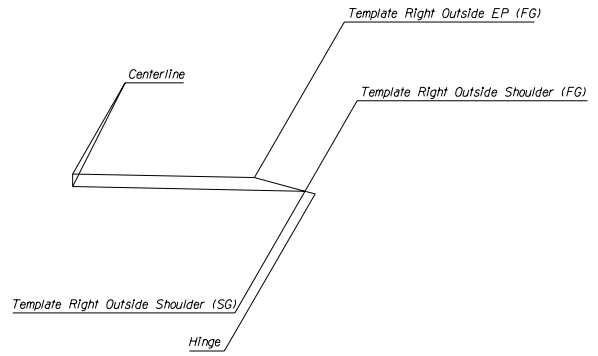


UD (1)
TYPICAL SECTION
Urban Freeway Ultimate Facility Normal Crown

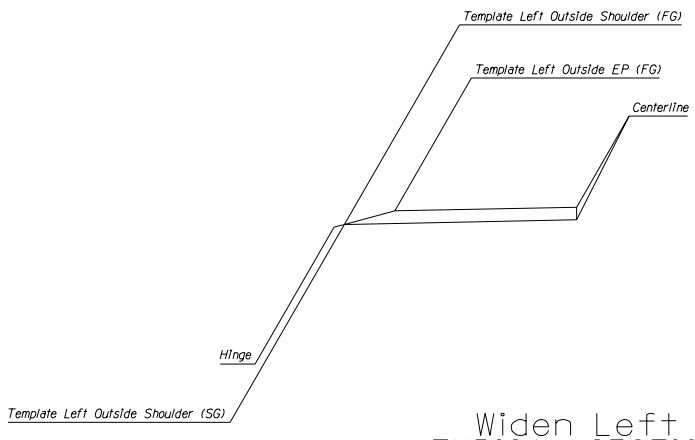


UC with Sidewalk
TYPICAL SECTION
Urban 48' Section with Sidewalk

Figure B5

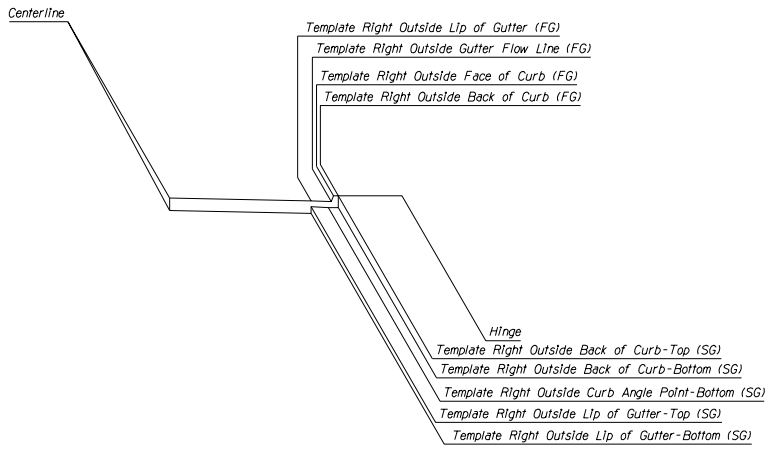


Widen Right
TYPICAL SECTION
Sawcut and Widen (18' Right)

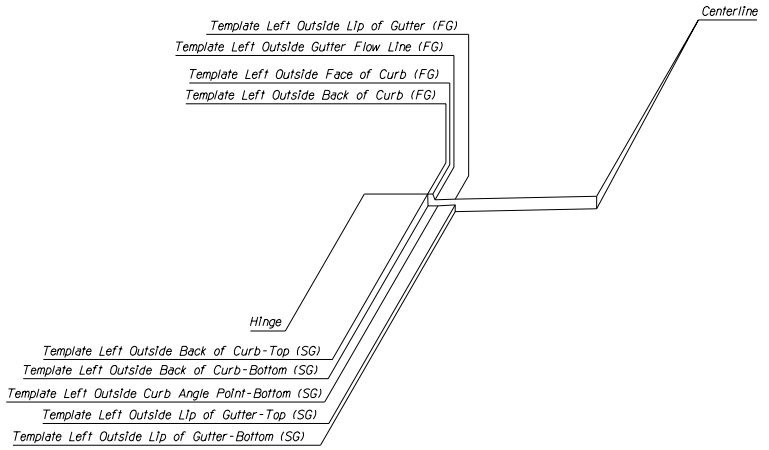


Widen Left
TYPICAL SECTION
Sawcut and Widen (18' Left)

Figure B6



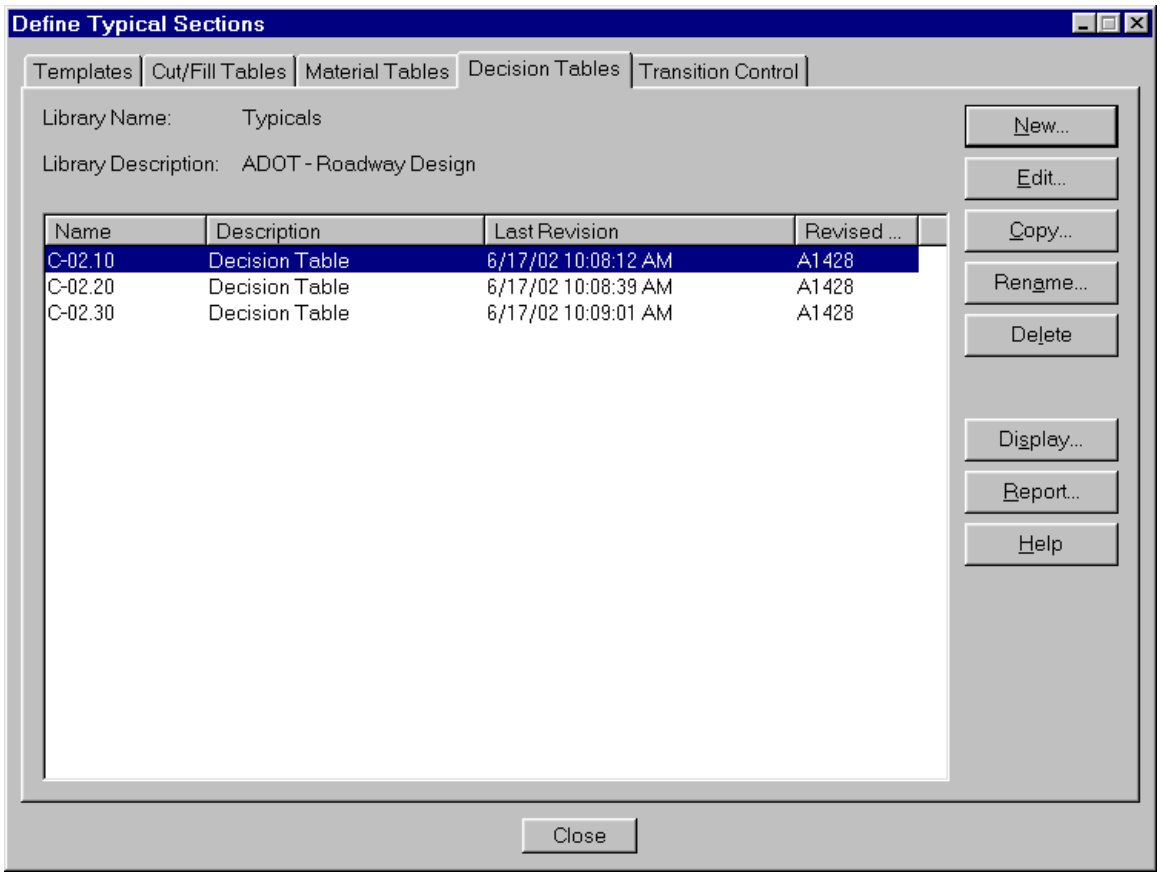
Widen Right with Curb
TYPICAL SECTION
Sawcut and Widen (16' Right) with Curb

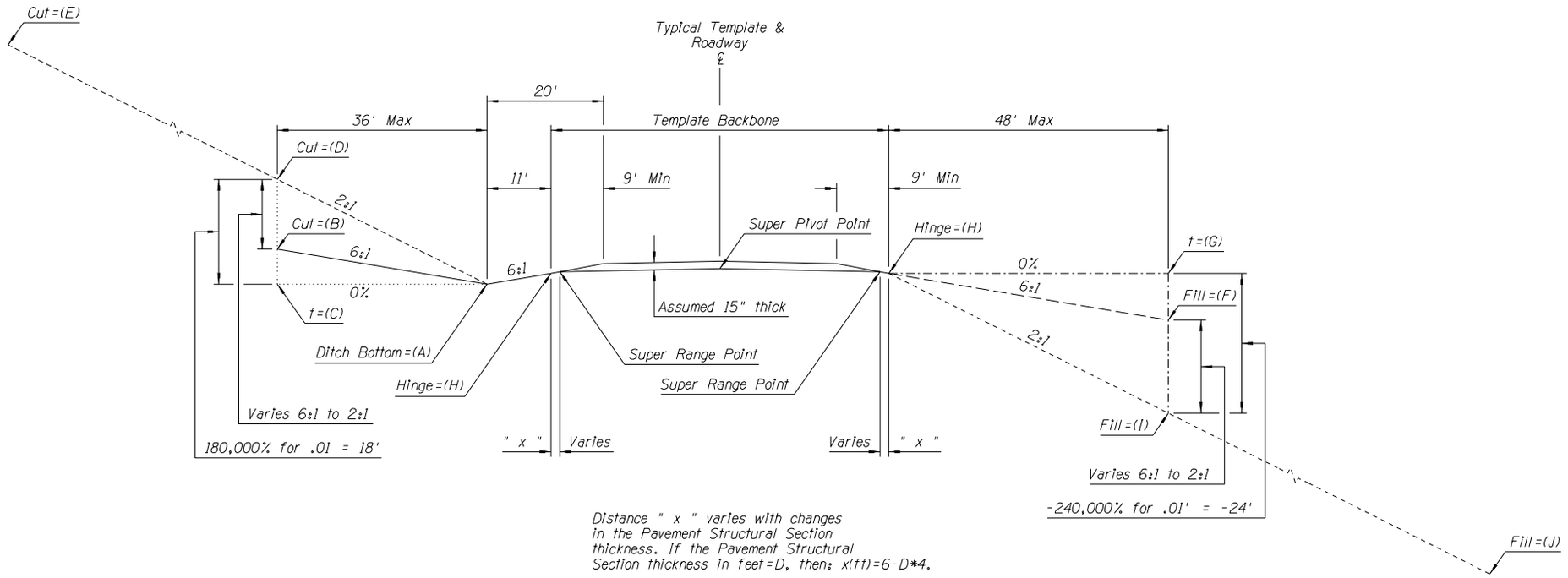


Widen Left with Curb
TYPICAL SECTION
Sawcut and Widen (16' Left) with Curb

Figure B7

DECISION TABLES





Distance " x " varies with changes in the Pavement Structural Section thickness. If the Pavement Structural Section thickness in feet=D, then: x(ft)=6-D*4.

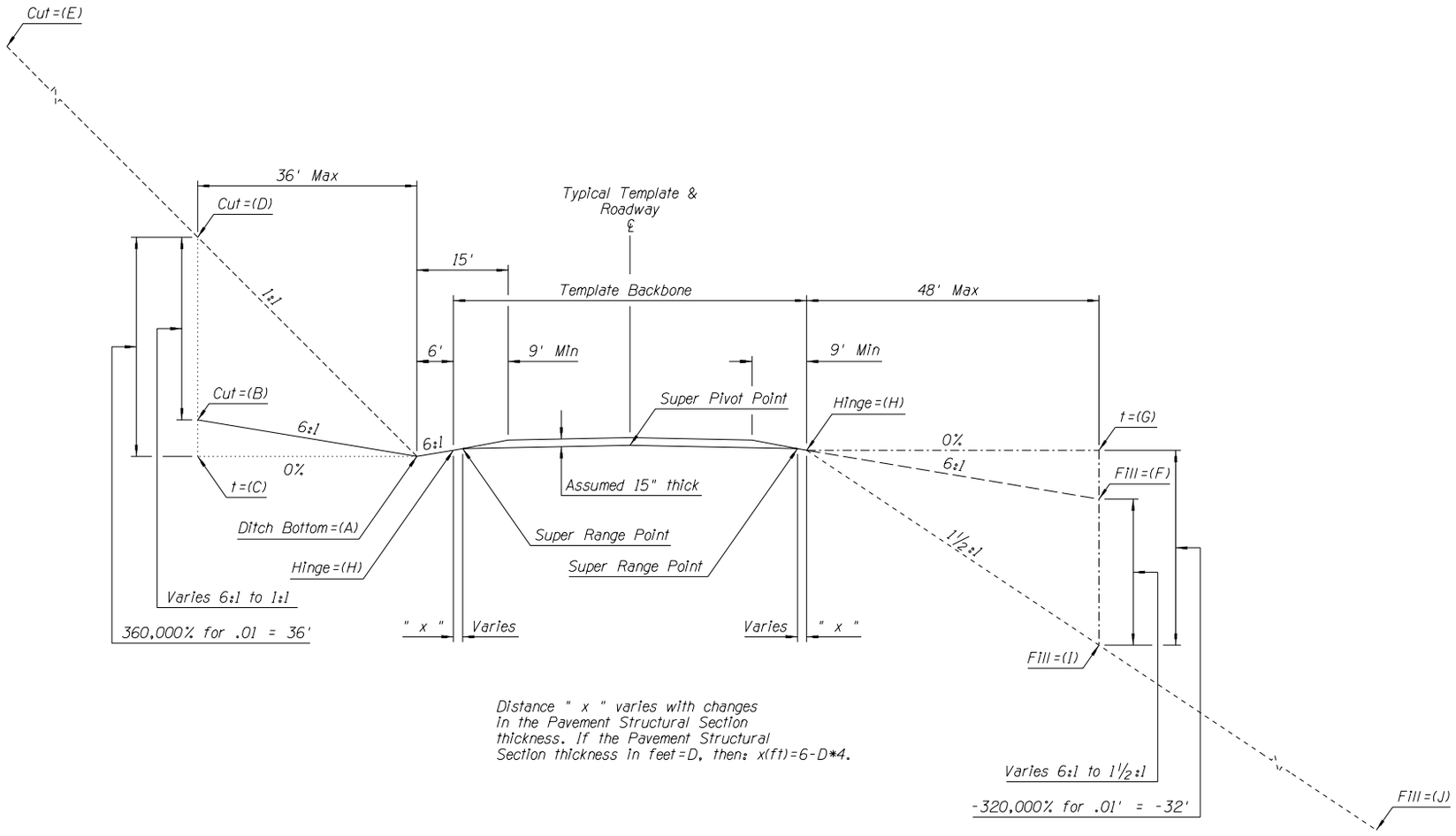
All decision tables and templates were developed using an assumed Pavement Structural Section thickness of 15". Adjustments will have to be made in the appropriate templates and decision tables for the correct Pavement Structural Section thickness.

Edit Decision Table

Name: C-02.10 Decsription: Decision Table

Index	Target	Start TC	End TC	Slope	Width	Seek Intersection	Construct Point	Attach After	Start Repeat	Target Type	Elevation Adjustment
0	ground	Hinge=(H)	Ditch Bottom=(A)	-16.6670%	11.00		*			DTM	0.00
1		Ditch Bottom=(A)	Cut=(B)	16.6670%	36.00	*					
2		Ditch Bottom=(A)	t=(C)	0.0000%	36.00						
3		t=(C)	Cut=(D)	180000.0000%	0.01	*					
4		Ditch Bottom=(A)	Cut=(E)	50.0000%	500.00	*					
5		Hinge=(H)	Fill=(F)	-16.6670%	48.00	*					
6		Hinge=(H)	t=(G)	0.0000%	48.00						
7		t=(G)	Fill=(I)	-240000.0000%	0.01	*					
8		Hinge=(H)	Fill=(J)	-50.0000%	500.00	*					

Decision Table
C–02.10
Figure C1



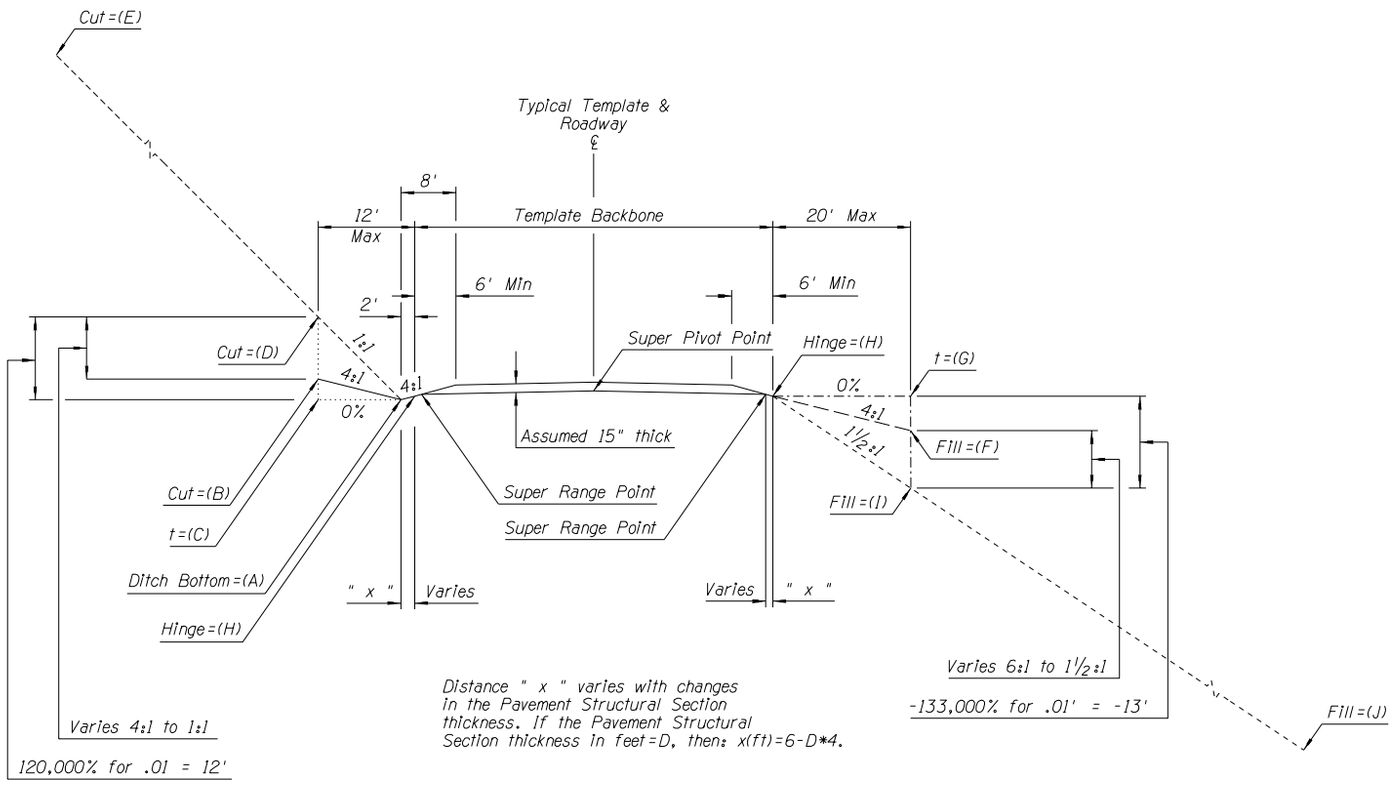
All decision tables and templates were developed using an assumed Pavement Structural Section thickness of 15". Adjustments will have to be made in the appropriate templates and decision tables for the correct Pavement Structural Section thickness.

Edit Decision Table

Name: C-02.20 Decsription: Decision Table

Index	Target	Start TC	End TC	Slope	Width	Seek Intersection	Construct Point	Attach After	Start Repeat	Target Type	Elevation Adjustment
0	ground	Hinge=(H)	Ditch Bottom=(A)	-16.6670%	6.00		*			DTM	0.00
1		Ditch Bottom=(A)	Cut=(B)	16.6670%	36.00	*					
2		Ditch Bottom=(A)	t=(C)	0.0000%	36.00						
3		t=(C)	Cut=(D)	360000.0000%	0.01	*					
4		Ditch Bottom=(A)	Cut=(E)	100.0000%	500.00	*					
5		Hinge=(H)	Fill=(F)	-16.6670%	48.00	*					
6		Hinge=(H)	t=(G)	0.0000%	48.00						
7		t=(G)	Fill=(I)	-320000.0000%	0.01	*					
8		Hinge=(H)	Fill=(J)	-66.6666%	500.00	*					

Decision Table
C–02.20
Figure C2



All decision tables and templates were developed using an assumed Pavement Structural Section thickness of 15". Adjustments will have to be made in the appropriate templates and decision tables for the correct Pavement Structural Section thickness.

Edit Decision Table

Name: C-02.30 Decsription: Decision Table

Index	Target	Start TC	End TC	Slope	Width	Seek Intersection	Construct Point	Attach After	Start Repeat	Target Type	Elevation Adjustment
0	ground	Hinge=(H)	Ditch Bottom=(A)	-25.0000%	2.00		*			DTM	0.00
1		Ditch Bottom=(A)	Cut=(B)	25.0000%	12.00	*					
2		Ditch Bottom=(A)	t=(C)	0.0000%	12.00						
3		t=(C)	Cut=(D)	120000.0000%	0.01	*					
4		Ditch Bottom=(A)	Cut=(E)	100.0000%	500.00	*					
5		Hinge=(H)	Fill=(F)	-25.0000%	20.00	*					
6		Hinge=(H)	t=(G)	0.0000%	20.00						
7		t=(G)	Fill=(I)	-133333.3333%	0.01	*					
8		Hinge=(H)	Fill=(J)	-66.6666%	500.00	*					

Decision Table
C–02.30
Figure C3